STRUCTURAL CALCULATIONS

KENSINGTON HOMES

NEW 'VILLAS'

ADDRESS:

AVENUE I & 32ND STREET

WEST LANCASTER, CA

December 17, 2019

PREPARED BY:

DAVID CHOI & ASSOCIATES, INC.

JOB # 18-122

DESIGN AIDES

DESIGN CRITERIA

1) All materials and construction shall conform to the requirements of 2016 California Building Code.

2) All lumber shall be Douglas Fir and graded as follows (Grading rule No. 17)

Framing	Grade
Light Framing	Construction
Joist & Planks	No. 2
Beams & Stringers	No. 1
Posts & Timbers	No. 1

3) Glue-Laminated Timbers shall be graded No. 24F-V8.

4) Plywood shall conform to PS 1-95, Structural I.

5) Structural steel shall conform to the following standards:
   Wide flange shapes…… ASTM A992
   HSS shapes…… ASTM A500, Grade B
   Pipe shapes…… ASTM A53 , Grade B
   Other rolled shapes, Bars and plates…….. ASTM A36

6) Structural steel shall be fabricated in an approved fabricator shop.

7) All welding shall be done by certified welders in an approved shop or in-field with special inspection

8) All concrete shall develop a minimum compressive strength of 2500 psi after 28 days.

9) Reinforcing steel shall conform to ASTM 615, Grade 60.

10) Concrete Block shall conform to ASTM C90, Grade N-1.

11) Grout shall develop a minimum compressive strength 2000 psi after 28 days.

12) Mortar shall be Type S and develop a compressive strength of 1800 psi after 28 days.

13) Soil supporting footings shall be natural grade or engineered fill.

14) Soil allowable bearing pressure for design is 1200 psf

15) Footings shall extend a minimum of 24 inches into undisturbed soil or 24 inches below finished grade, whichever is lower.

DAVID CHOI & ASSOCIATES

DOUGLAS FIR-LARCH DESIGN VALUES (#, in.)								
DESIGNATION	GRADE	F_B	F_T	$F_{C\perp}$	F_C	F_V	E	E_{MIN}
LIGHT FRAMING 2" TO 4" WIDTH 2" TO 4' DEPTH	CONSTRUCTION	1000	650	625	1650	180	1,500,000	550,000
JOIST & PLANKS 2" TO 4" WIDTH 6" & DEEPER	NO. 2	900	575	625	1350	180	1,600,000	580,000
POST & TIMBER 5x5 AND LARGER DEPTH NOT MORE THAN 2" GREATER THAN WIDTH	NO. 1	1200	825	625	1000	170	1,600,000	580,000
BEAM & STRINGER 5" & WIDER DEPTH MORE THAN 2" GREATER THAN THICKNESS	NO. 1	1350	675	625	925	170	1,600,000	580,000
GLU-LAM BEAMS	COMBINATION NO. 24F-V8	2400	1100	650	1650	265	1,800,000	930,000
	Weak-Axis:	1450	1100	560	1650	230	1,600,000	830,000

1) THE ABOVE VALUES ARE TAKEN FROM THE 2010 NDS.
2) USE STANDARD GRADING RULE NO. 17.

David Choi & Associates

PROJECT :
CLIENT :
JOB NO. :
DATE :

PAGE :
DESIGN BY :
REVIEW BY :

Snow Load Analysis Based on ASCE 7-2010

INPUT DATA & DESIGN SUMMARY

BASIC GROUND SNOW LOAD (ASCE Sec. 7.2)	P_g =	5	psf, (ASCE page 29)	$P_{f,\ roof}$ =	4.00	psf
SNOW EXPOSURE FACTOR	C_e =	1	(Tab. 7-2, pg 30)	$P_{f,\ overhang}$ =	5.60	psf
THERMAL FACTOR (0.85 , 1.0 , 1.1 , 1.2, or 1.3)	C_t =	1	(Tab. 7-3, pg 30)	$P_{f,\ valley}$ =	5.60	psf
IMPORTANCE FACTOR	I_s =	0.8	(Tab. 1.5-1 & 1.5-2, 7.3.3 pg 29)	$P_{f,\ parapet}$ =	14.71	psf
ROOF SLOPE		0 / 12		W_d =	2.92	ft
PARAPET HEIGHT (DRIFT CORNER HEIGHT)	h_r =	3.5	ft, see fig. below			
LENGTH OF THE ROOF UPWIND OF THE DRIFT	L_u =	25	ft, see fig. below	P_1 =	0.00	psf
OBSTRUCTED SLIPPERY SURFACE (Sec. 7.4, pg 31 & 36) **?** (1=Yes, 0=No)		0	Unobstructed	P_2 =	0.00	psf
				P_3 =	0.00	psf
				P_4 =	0.00	psf
				x =	0.00	ft

MAX SNOW = 15.0 PSF

ANALYSIS

FLAT SNOW LOADS (Sec 7.3, pg 29)

$P_f = 0.7 C_e C_t I_s P_g$ = 4.00 psf

Where α_{roof} = 0.0 ^{0}

W = 12.5 ft

$P_{f,\ min}$ = 4.00 psf, (Sec. 7.3.4, pg 29)

ROOF SNOW LOADS (Sec. 7.4, pg 31)

$P_s = C_s P_f$ = 4.00 psf, (Eq.7.4-1)

Where C_s = 1.000

, Derived from Fig 7-2, page 86, as following table

C_t	0.85 or 1.0	1.1	1.2 or 1.3
Unobstructed	$C_{s,1}$	$C_{s,3}$	$C_{s,5}$
Obstructed	$C_{s,2}$	$C_{s,4}$	$C_{s,6}$

$C_{s,1}$ = MIN [(70 - α) / 65, 1.0] , Fig. 7-2a dash line

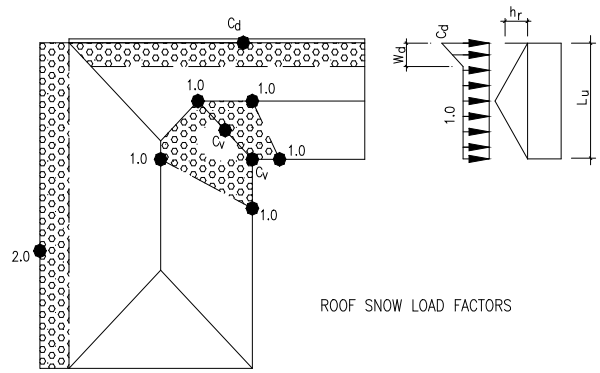
$C_{s,2}$ = MIN [(70 - α) / 40, 1.0] , Fig. 7-2a solid line

$C_{s,3}$ = MIN [(70 - α) / 60, 1.0] , Fig. 7-2b dash line

$C_{s,4}$ = MIN [(70 - α) / 32.5, 1.0] , Fig. 7-2b solid line

$C_{s,5}$ = MIN [(70 - α) / 55, 1.0] , Fig. 7-2c dash line

$C_{s,6}$ = MIN [(70 - α) / 25, 1.0] , Fig. 7-2c solid line



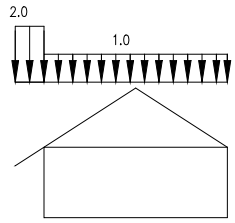
ROOF SNOW LOAD FACTORS

SNOW LOADS AT OVERHANG, VALLEY, AND PARAPET CORNER

$P_{f,\ overhang} = 2 P_f$ = 5.60 psf, (Sec.7.4.5, pg 31)

$P_{f,\ valley} = C_v P_f$ = 5.60 psf, (Sec.7.6.3, pg 32)

Where $C_v = 2 / C_e$ = 2.00 , (Fig. 7-6, pg 40)



$P_{f,\ parapet} = C_d P_s = MIN[\gamma(h_d + h_b), \gamma h_r]$

= 14.71 psf, (Sec.7.7.1, pg 32)

Where $\gamma = MIN(0.13P_g + 14, 30)$ = 14.65 pcf, (7.7-1)

$h_b = P_s / \gamma$ = 0.27 ft, (Sec. 7.1)

$h_c = h_r - h_b$ = 3.23 ft, (Fig. 7.8)

h_c / h_b = 11.82 **>** 0.2, (Sec.7.7.1)

(Drift load need be considered)

$h_d = 0.75\ [0.43(L_u)^{1/3}(P_g + 10)^{1/4} - 1.5]$

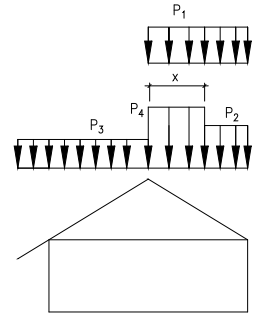
= 0.73 ft, (Sec.7.8 & Fig.7-9)

C_d = 3.68 , (see fig. right)

W_d = { $4h_d$ = 2.92 ft, for $h_d<h_c$; $4h_d^2 / h_c$ = N/A ft, for $h_d>h_c$ }

(Sec.7.7.1, pg 33)

$W_{d,max} = 8\ h_c$ = 25.82 ft



ROOF UNBLANCED SNOW LOADS

ROOF UNBALANCED SNOW LOADS

$P_{surcharge}$ = 5.00 psf, (Sec. 7.10, pg 33)

$P_1 = P_{surcharge} + I_s P_g$ = 0.00 psf, (unbalanced load, Fig 7-5)

$P_2 = (P_{surcharge} + P_s)$ = 0.00 psf, (unbalanced load, Fig 7-5)

$P_3 = 0.3\ P_2$ = 0.00 psf, (unbalanced load, Fig 7-5)

$P_4 = P_2 + h_d \gamma / (1 / \tan \alpha_{roof})^{0.5}$ = 0.00 psf

$x = (8 / 3)\ h_d\ (1 / \tan \alpha_{roof})^{0.5}$ = 0.00 ft

Note : Where flat roof snow loads exceed 30 psf, the seismic dead load shall include 20% design snow load. (ASCE 7-10 Sec. 12.7.2.4)

DEAD LOADS

ROOF LOADS

Built-up Roofing		2.5 psf
Re-roof		2.0 psf
1/2" Plywood (On Sleepers)		1.5 psf
Sleepers		2.0 psf
1/2" Plywood		1.5 psf
Rafters		2.0 psf
Insulation		0.5 psf
Ceiling (.55psf per 1/8")		2.5 psf
Beams/Headers		1.5 psf
MP&E/ misc.		2.0 psf
	D=	18.0 psf
	Solar Panels =	6.0 psf
	D_{TOTAL} =	24.0 psf
	Lr =	20.0 psf
	Snow =	15.0 psf

FLOOR LOADS

Flooring		1.5 psf
1" Gypcrete Topping (105 pcf)		8.8 psf
1/4" Acustamat		0.5 psf
3/4" Plywood		2.3 psf
Joist		4.0 psf
Ceiling x 2		2.3 psf
Beams/Headers		1.5 psf
MP&E/ misc.		2.1 psf
	D=	23.0 psf
	L=	40.0 psf

EXTERIOR WALL LOADS

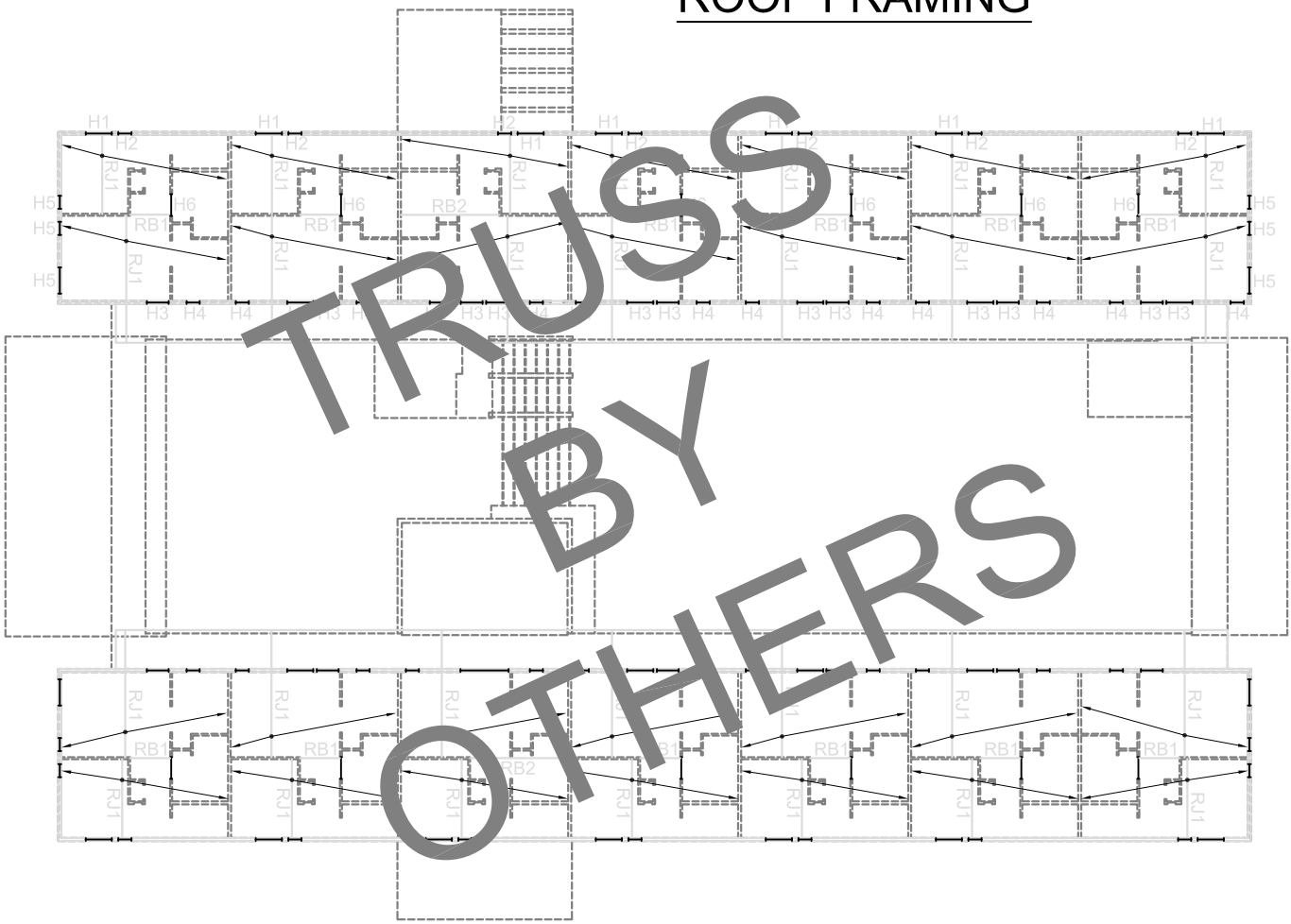
7/8" Stucco		10.0 psf
1/2" Plywood		1.5 psf
2x6 Studs @ 16"oc		1.5 psf
Insulation		0.5 psf
1/2" Gyp Board		2.3 psf
MP&E/ Misc.		0.2 psf
	D=	16.0 psf

INTERIOR WALL LOADS

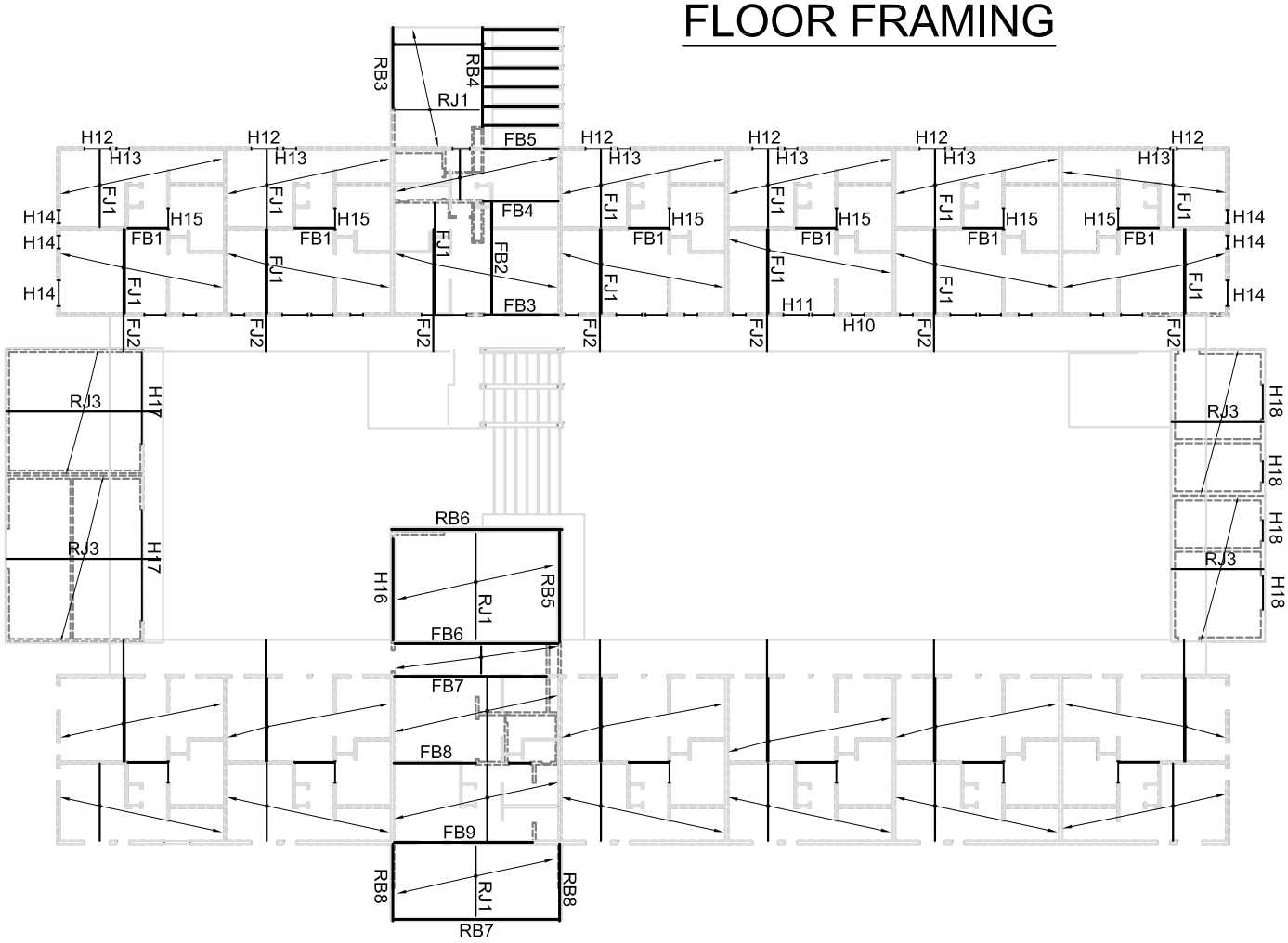
1/2" Gyp Board		2.3 psf
1/2" Plywood		1.5 psf
2x6 Studs @ 16"oc		1.5 psf
Insulation		0.5 psf
1/2" Gyp Board		2.3 psf
MP&E/ Misc.		1.9 psf
	D=	10.0 psf

WOOD FRAMING - GRAVITY

ROOF FRAMING

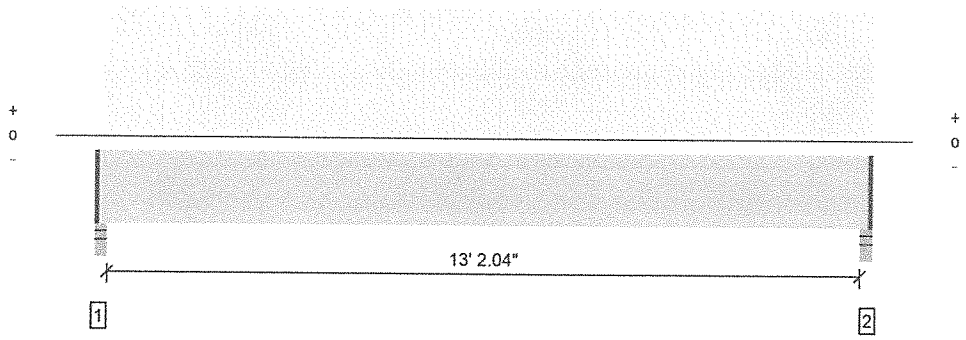


FLOOR FRAMING



1 piece(s) 2 x 12 Douglas Fir-Larch No. 2 @ 16" OC

Overall Length: 13' 9.04"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	578 @ 2.50"	2109 (2.25")	Passed (27%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	482 @ 1' 2.75"	2025	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1897 @ 6' 10.52"	2729	Passed (70%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.133 @ 6' 10.52"	0.445	Passed (L/999+)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.213 @ 6' 10.52"	0.667	Passed (L/750)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	--	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 7' 2.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 7.00" o/c unless detailed otherwise.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	220	367	587	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	2.25"	1.50"	220	367	587	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 13' 9.04"	16"	24.0	40.0	Residential - Living Areas

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

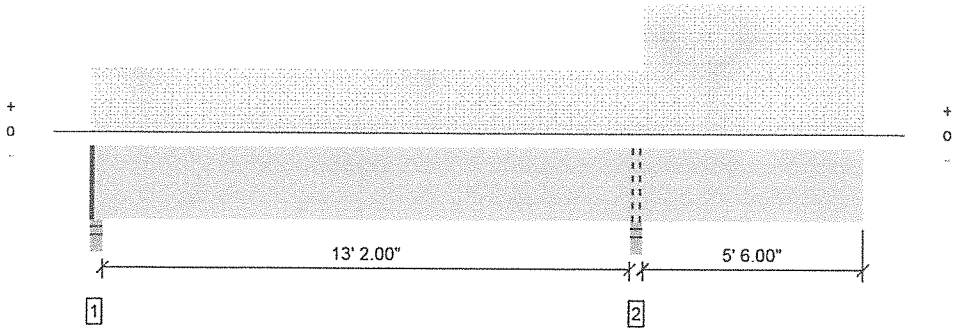
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

2 piece(s) 2 x 10 Douglas Fir-Larch No. 2 @ 16" OC

Right overhang exceeds the maximum length of 5' 0.00" for this product.

Overall Length: 19' 3.00"



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1744 @ 13' 7.25"	6563 (3.50")	Passed (27%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	820 @ 14' 6.25"	3330	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-2762 @ 13' 7.25"	3044	Passed (91%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.385 @ 19' 3.00"	0.376	Passed (2L/352)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.401 @ 19' 3.00"	0.565	Passed (2L/338)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	--	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 19' 2.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 7.00" o/c unless detailed otherwise.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Moment capacity over cantilever support 2 has been reduced by 25% to lessen the effects of buckling.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	173	368/-153	541/-153	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	3.50"	1.50"	487	1257	1744	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 13' 9.00"	16"	24.0	40.0	Residential - Living Areas
2 - Uniform (PSF)	13' 9.00" to 19' 3.00"	16"	30.0	100.0	Balcony

Weyerhaeuser Notes

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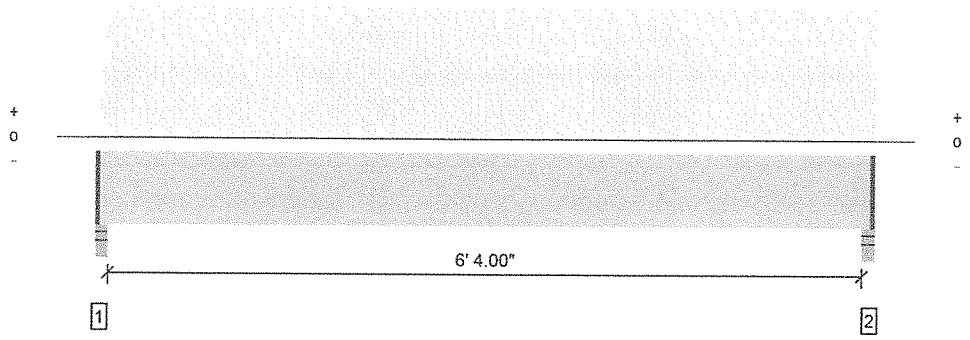
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 4 x 12 Douglas Fir-Larch No. 2

Overall Length: 6' 11.00"



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4049 @ 2.00"	4922 (2.25")	Passed (82%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	2548 @ 1' 2.75"	4725	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	6191 @ 3' 5.50"	6091	Passed (102%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.037 @ 3' 5.50"	0.219	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.077 @ 3' 5.50"	0.329	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 8.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 8.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.85"	2171	1781	890	4842	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	2.25"	1.85"	2171	1781	890	4842	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 6' 9.75"	N/A	10.0			
1 - Uniform (PSF)	0 to 6' 11.00" (Front)	12' 10.50"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 6' 11.00" (Front)	12' 10.50"	24.0	-	20.0	Roof

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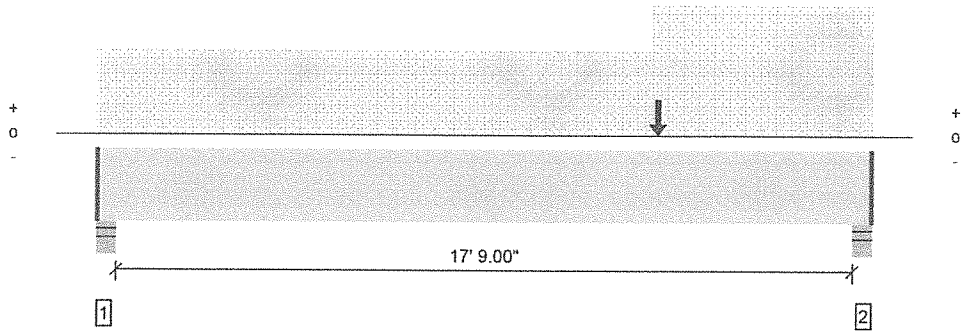
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 18' 8.00"



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Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4843 @ 18' 4.00"	13945 (4.25")	Passed (35%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	3627 @ 17' 3.25"	11419	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	20180 @ 13' 6.00"	33694	Passed (60%)	1.25	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Live Load Defl. (in)	0.320 @ 9' 10.56"	0.600	Passed (L/675)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.791 @ 9' 11.55"	0.900	Passed (L/273)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 18' 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 18' 6.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	1.50"	1503	996	539	3038	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.50"	3004	996	1470	5470	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 18' 6.75"	N/A	18.5			
1 - Uniform (PSF)	0 to 18' 8.00" (Front)	2' 8.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	13' 3.96" to 18' 8.00" (Front)	9' 0.00"	10.0	-	-	Wall
3 - Point (lb)	13' 6.00" (Front)	N/A	2506	-	2009	Linked from: RB2, Support 2

Weyerhaeuser Notes

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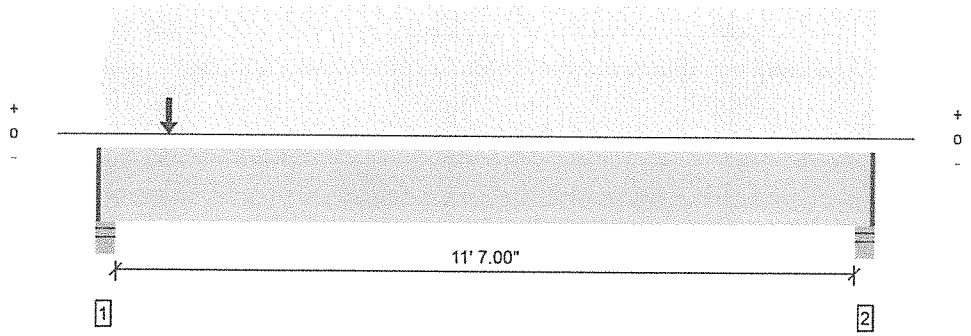
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 12' 6.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	10751 @ 4.00"	13945 (4.25")	Passed (77%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	8161 @ 1' 4.75"	11419	Passed (71%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	24305 @ 6' 1.41"	26955	Passed (90%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.232 @ 6' 2.46"	0.394	Passed (L/613)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.502 @ 6' 2.43"	0.592	Passed (L/283)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' 3.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' 3.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	3.28"	5917	4707	1923	12547	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.58"	4625	3851	1460	9936	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 12' 4.75"	N/A	18.5			
1 - Uniform (PSF)	0 to 12' 6.00" (Front)	8' 10.50"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 12' 6.00" (Front)	9' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 12' 6.00" (Front)	2' 6.00"	30.0	100.0	-	Balcony
4 - Uniform (PSF)	0 to 12' 6.00" (Front)	11' 4.50"	24.0	-	20.0	Roof
5 - Point (lb)	1' 2.00" (Front)	N/A	1503	996	539	Linked from: FB2, Support 1

Weyerhaeuser Notes

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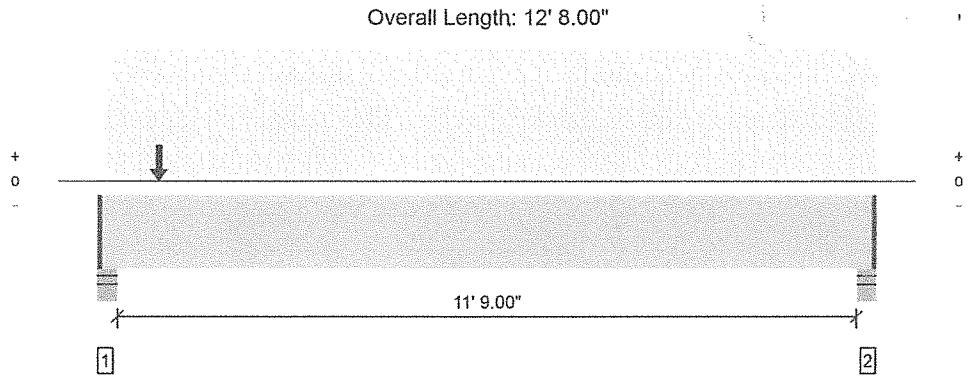
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

FORTE MEMBER REPORT *Floor, FB4* 13 PASSED

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12085 @ 4.00"	13945 (4.25")	Passed (87%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	7720 @ 1' 4.75"	11419	Passed (68%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	21883 @ 6' 1.66"	26955	Passed (81%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.229 @ 6' 3.39"	0.400	Passed (L/630)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.488 @ 6' 3.24"	0.600	Passed (L/295)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' 6.00" o/c unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	3.68"	6828	4171	3003	14002	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.37"	4158	3285	1697	9140	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 12' 6.75"	N/A	18.5			
1 - Uniform (PSF)	0 to 12' 8.00" (Front)	12' 9.00"	24.0	40.0	-	Residential - Living Areas
2 - Point (lb)	1' 0.00" (Front)	N/A	3004	996	1470	Linked from: FB2, Support 2
3 - Uniform (PSF)	0 to 12' 8.00" (Front)	12' 9.00"	24.0	-	20.0	Roof

Weyerhaeuser Notes

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

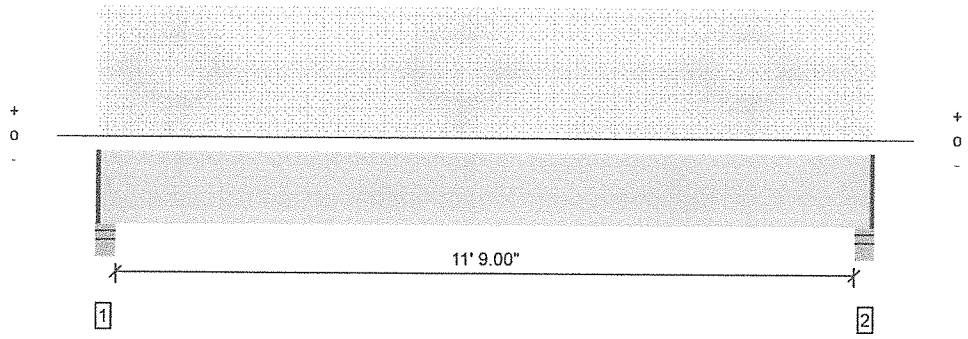
Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

6/13/2018 3:04:10 PM
Forte v5.3, Design Engine: V7.0.0.5
18-122 REDESIGN.4te

FORTE MEMBER REPORT *Floor, FB5* 14 PASSED

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 12' 8.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3402 @ 4.00"	13945 (4.25")	Passed (24%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	2594 @ 1' 4.75"	11419	Passed (23%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	9458 @ 6' 4.00"	26955	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.069 @ 6' 4.00"	0.400	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.203 @ 6' 4.00"	0.600	Passed (L/708)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' 6.00" o/c unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	1.50"	2281	1045	523	3849	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	1.50"	2281	1045	523	3849	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 12' 6.75"	N/A	18.5			
1 - Uniform (PSF)	0 to 12' 8.00" (Front)	4' 1.50"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 12' 8.00" (Front)	9' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 12' 8.00" (Front)	4' 1.50"	24.0	-	20.0	Roof

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

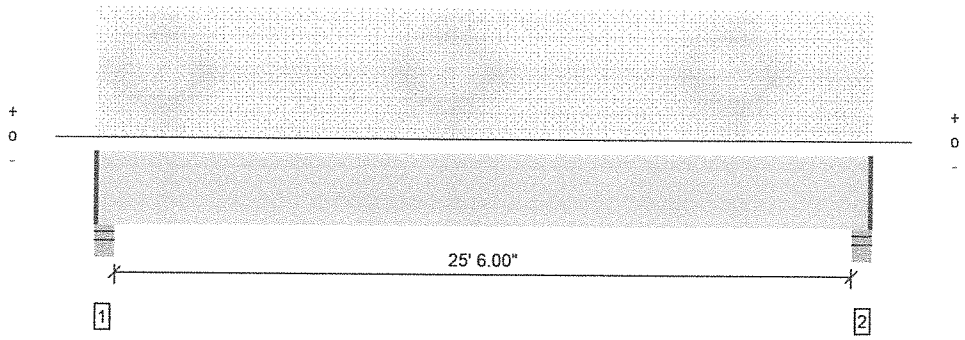
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

6/13/2018 3:06:44 PM
Forte v5.3, Design Engine: V7.0.0.5
18-122 REDESIGN.4te

1 piece(s) 5 1/4" x 18" 2.2E Parallam® PSL

Overall Length: 26' 5.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8453 @ 4.00"	13945 (4.25")	Passed (61%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	6469 @ 1' 11.50"	18270	Passed (35%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	47660 @ 13' 2.50"	65497	Passed (73%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.603 @ 13' 2.50"	0.858	Passed (L/513)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	1.196 @ 13' 2.50"	1.288	Passed (L/258)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 26' 3.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 26' 3.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	2.58"	4224	3368	2355	9947	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.58"	4224	3368	2355	9947	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 26' 3.75"	N/A	29.5			
1 - Uniform (PSF)	0 to 26' 5.00" (Front)	8' 11.00"	24.0	-	20.0	Roof
2 - Uniform (PSF)	0 to 26' 5.00" (Front)	2' 6.60"	30.0	100.0	-	Balcony

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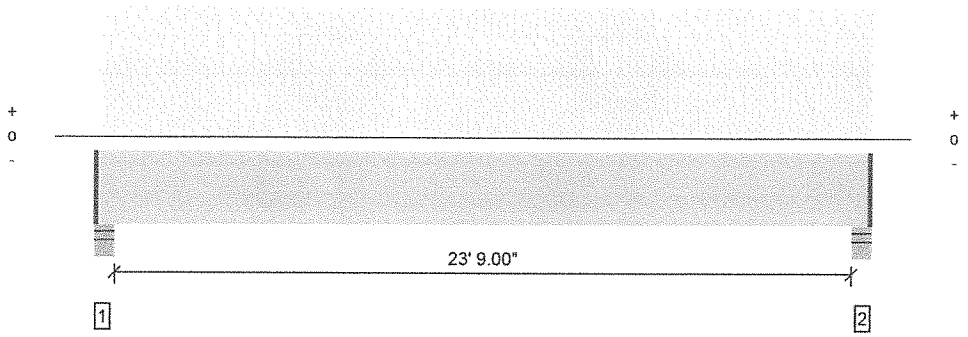
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

3 piece(s) 7" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 24' 8.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	14488 @ 4.00"	18594 (4.25")	Passed (78%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	12860 @ 1' 4.75"	15225	Passed (84%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	84655 @ 12' 4.00"	35940	Failed (236%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	2.239 @ 12' 4.00"	0.800	Failed (L/129)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	4.953 @ 12' 4.00"	1.200	Failed (L/58)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 24' 6.00" o/c unless detailed otherwise.
- Member should be side-loaded from both sides of the member to prevent rotation.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	3.31"	8003	6495	2313	16811	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	3.31"	8003	6495	2313	16811	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 24' 6.75"	N/A	24.6			
1 - Uniform (PSF)	0 to 24' 8.00" (Front)	6' 9.50"	24.0	40.0	-	Floor
2 - Uniform (PSF)	0 to 24' 8.00" (Front)	2' 6.60"	30.0	100.0	-	Balcony
3 - Uniform (PSF)	0 to 24' 8.00" (Front)	10' 0.00"	16.0	-	-	Wall
4 - Uniform (PSF)	0 to 24' 8.00" (Front)	9' 4.50"	24.0	-	20.0	Roof

Weyerhaeuser Notes

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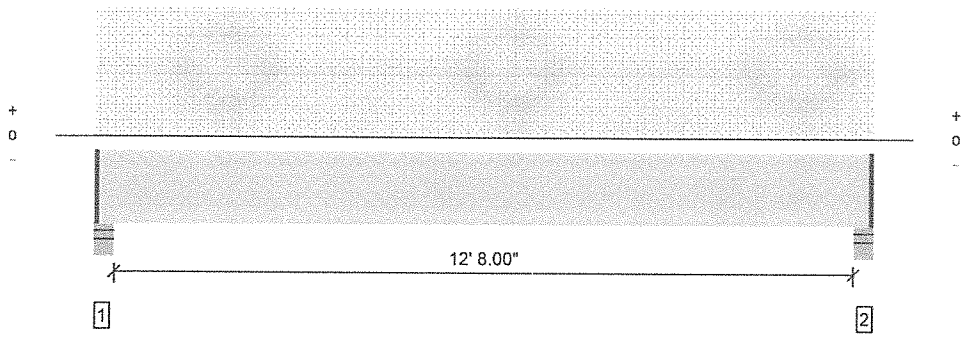
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 13' 7.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	8878 @ 4.00"	13945 (4.25")	Passed (64%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	6812 @ 1' 4.75"	11419	Passed (60%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	26330 @ 6' 9.50"	26955	Passed (98%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.289 @ 6' 9.50"	0.431	Passed (L/536)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.656 @ 6' 9.50"	0.646	Passed (L/236)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 5.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 5.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	2.71"	5041	3532	1766	10339	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.71"	5041	3532	1766	10339	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 13' 5.75"	N/A	18.5			
1 - Uniform (PSF)	0 to 13' 7.00" (Front)	13' 0.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 13' 7.00" (Front)	10' 0.00"	10.0	-	-	Wall
3 - Uniform (PSF)	0 to 13' 7.00" (Front)	13' 0.00"	24.0	-	20.0	Roof

Weyerhaeuser Notes

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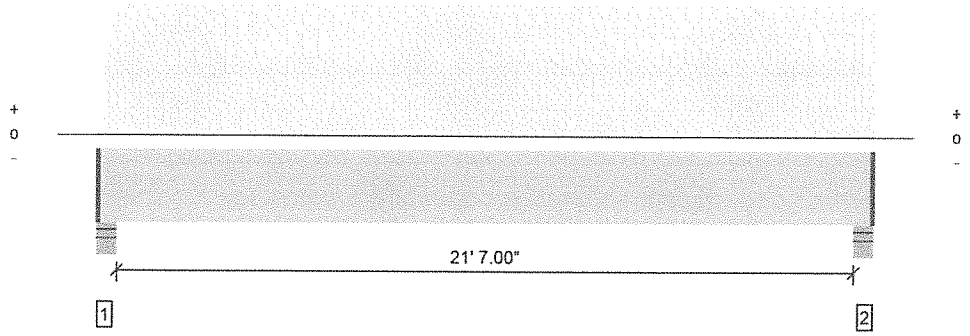
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

3 piece(s) 7" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 22' 6.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	9715 @ 4.00"	18594 (4.25")	Passed (52%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	7423 @ 1' 4.75"	15225	Passed (49%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	44883 @ 11' 3.00"	35940	Failed (125%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	1.050 @ 11' 3.00"	0.728	Failed (L/249)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	2.508 @ 11' 3.00"	1.092	Failed (L/104)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 22' 3.00" o/c unless detailed otherwise.
- Member should be side-loaded from both sides of the member to prevent rotation.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	2.22"	5697	2775	2700	11172	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.22"	5697	2775	2700	11172	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 22' 4.75"	N/A	24.6			
1 - Uniform (PSF)	0 to 22' 6.00" (Front)	6' 2.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 22' 6.00" (Front)	10' 0.00"	10.0	-	-	Wall
3 - Uniform (PSF)	0 to 22' 6.00" (Front)	6' 0.00"	15.0	-	20.0	Roof 1
4 - Uniform (PSF)	0 to 22' 6.00" (Front)	6' 0.00"	24.0	-	20.0	Roof 2

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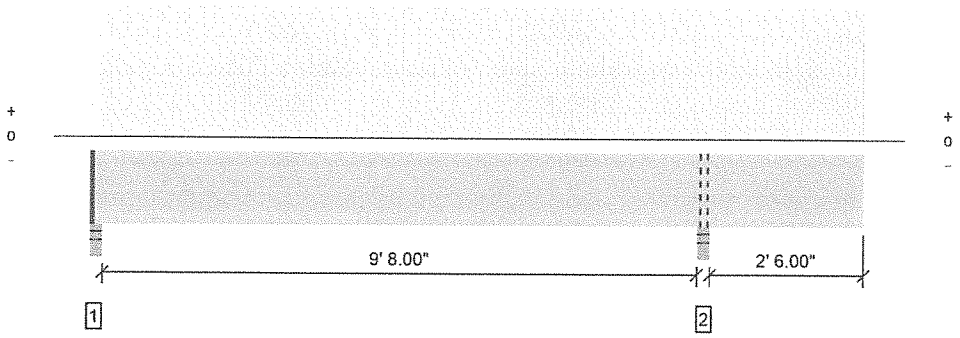
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 4 x 12 Douglas Fir-Larch No. 2

Overall Length: 12' 9.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1985 @ 10' 1.25"	7656 (3.50")	Passed (26%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1056 @ 9' 0.25"	5906	Passed (18%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	2768 @ 4' 10.56"	7614	Passed (36%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Live Load Defl. (in)	-0.032 @ 12' 9.00"	0.265	Passed (2L/999+)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	-0.053 @ 12' 9.00"	0.353	Passed (2L/999+)	--	1.0 D + 1.0 Lr (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 12' 8.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 12' 8.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	537	678	1215	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	3.50"	1.50"	896	1089	1985	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 12' 9.00"	N/A	10.0		
1 - Uniform (PSF)	0 to 12' 9.00" (Front)	6' 10.01"	15.0	20.0	Roof

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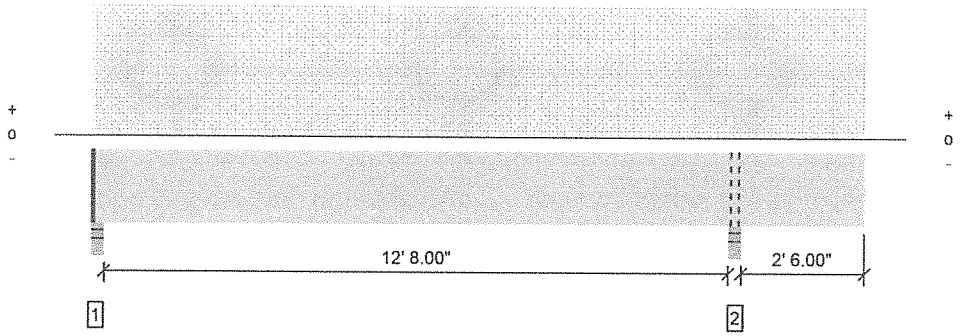
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 3 1/2" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 15' 9.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2784 @ 2.00"	4922 (2.25")	Passed (57%)	--	1.0 D + 1.0 Lr (Alt Spans)
Shear (lbs)	2483 @ 12' 0.25"	9516	Passed (26%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	8654 @ 6' 5.35"	22463	Passed (39%)	1.25	1.0 D + 1.0 Lr (Alt Spans)
Live Load Defl. (in)	-0.106 @ 15' 9.00"	0.265	Passed (2L/602)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	-0.169 @ 15' 9.00"	0.353	Passed (2L/376)	--	1.0 D + 1.0 Lr (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 15' 8.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 8.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	1127	1701	2828	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	3.50"	1.88"	1664	2456	4120	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 15' 9.00"	N/A	12.3		
1 - Uniform (PSF)	0 to 15' 9.00" (Front)	6' 10.01"	15.0	20.0	Roof
2 - Uniform (PSF)	0 to 15' 9.00" (Front)	6' 3.00"	10.0	20.0	Roof

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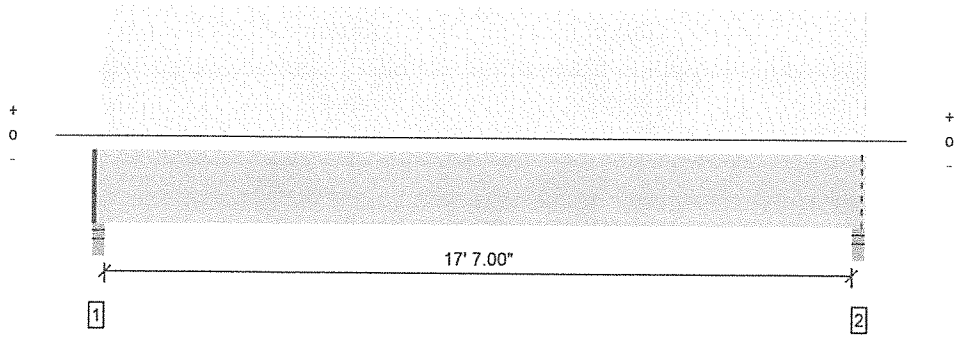
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 4 x 12 Douglas Fir-Larch No. 2

Overall Length: 18' 2.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1634 @ 2.00"	4922 (2.25")	Passed (33%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1429 @ 1' 2.75"	5906	Passed (24%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	7234 @ 9' 1.00"	7614	Passed (95%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.274 @ 9' 1.00"	0.892	Passed (L/781)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.623 @ 9' 1.00"	1.189	Passed (L/343)	--	1.0 D + 1.0 Lr (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 16' 5.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 18' 1.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	925	727	1652	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	3.50"	1.50"	926	727	1653	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 18' 2.00"	N/A	10.0		
1 - Uniform (PSF)	0 to 18' 2.00" (Front)	4' 0.00"	15.0	20.0	Roof
2 - Uniform (PSF)	0 to 18' 2.00" (Front)	2' 0.00"	16.0	-	Wall

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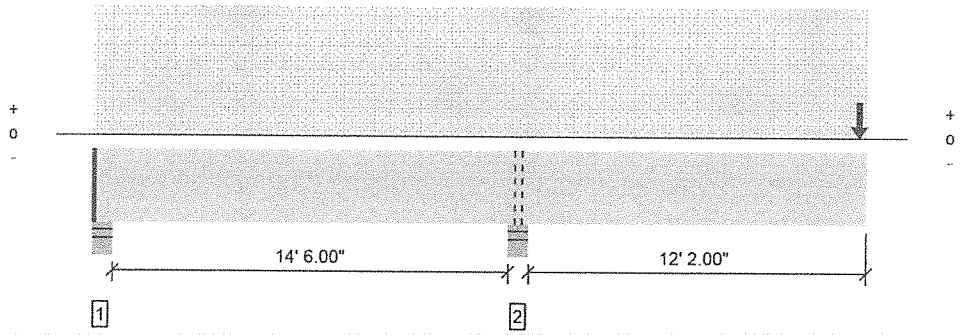
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 5 1/4" x 20" 2.2E Parallam® PSL

Right cantilever length exceeds 1/3 member length or 1/2 back span length.
Right overhang exceeds the maximum length of 7' 0.00" for this product.
This product failed due to an excessive uplift of -1054 lbs at support located at 2.75".

Overall Length: 27' 7.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	12380 @ 15' 2.25"	18047 (5.50")	Passed (69%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	5595 @ 17' 1.00"	25375	Passed (22%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	-48785 @ 15' 2.25"	74926	Passed (65%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.514 @ 27' 7.00"	1.240	Passed (2L/578)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	1.086 @ 27' 7.00"	1.653	Passed (2L/274)	--	1.0 D + 1.0 Lr (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 27' 6.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 27' 6.00" o/c unless detailed otherwise.
- Moment capacity over cantilever support 2 has been reduced by 25% to lessen the effects of buckling.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	1.50"	-243	623/-810	623/-1053	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	5.50"	3.77"	6626	5754	12380	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 27' 7.00"	N/A	32.8		
1 - Uniform (PSF)	0 to 27' 7.00" (Front)	8' 10.50"	15.0	20.0	Roof
2 - Uniform (PSF)	0 to 27' 7.00" (Front)	2' 0.00"	16.0	-	Wall
3 - Point (lb)	27' 3.00" (Front)	N/A	926	727	Linked from: RB5, Support 2

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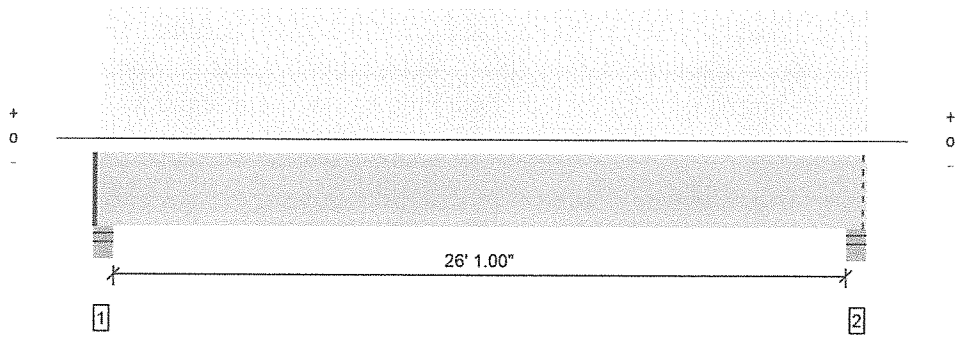
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 5 1/4" x 11 7/8" 2.2E Parallam® PSL

Overall Length: 27'



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	3074 @ 4.00"	13945 (4.25")	Passed (22%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	2766 @ 1' 5.38"	15066	Passed (18%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	19891 @ 13' 6.00"	37317	Passed (53%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.823 @ 13' 6.00"	1.317	Passed (L/384)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	1.574 @ 13' 6.00"	1.756	Passed (L/201)	--	1.0 D + 1.0 Lr (All Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 26' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 26' 11.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	5.50"	4.25"	1.50"	1476	1620	3096	1 1/4" Rim Board
2 - Stud wall - DF	5.50"	5.50"	1.50"	1478	1620	3098	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	1.25" to 27'	N/A	19.5		
1 - Uniform (PSF)	0 to 27' (Front)	6' 0.00"	15.0	20.0	Roof

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SUSTAINABLE FORESTRY INITIATIVE

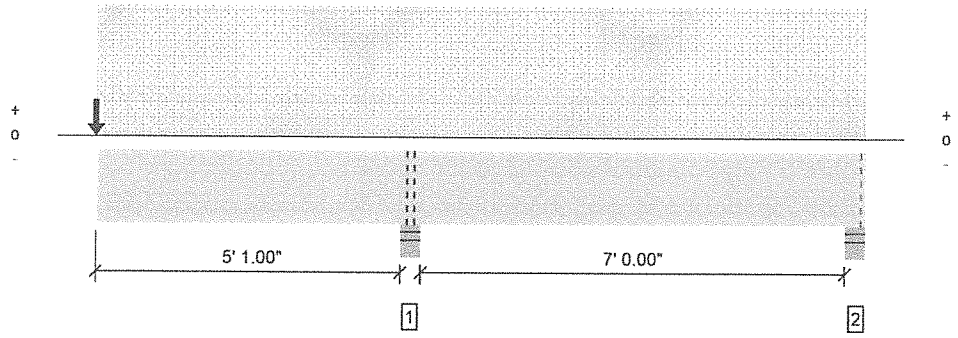
Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

FORTE MEMBER REPORT *Roof, RB8*

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Left cantilever length exceeds 1/3 member length or 1/2 back span length.
This product failed due to an excessive uplift of -2133 lbs at support located at 12' 8.00".

Overall Length: 13'



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	6301 @ 5' 3.75"	18047 (5.50")	Passed (35%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	3465 @ 4' 1.75"	14273	Passed (24%)	1.25	1.0 D + 1.0 Lr (All Spans)
Moment (Ft-lbs)	-17705 @ 5' 3.75"	33694	Passed (53%)	1.25	1.0 D + 1.0 Lr (All Spans)
Live Load Defl. (in)	0.272 @ 0	0.531	Passed (2L/470)	--	1.0 D + 1.0 Lr (Alt Spans)
Total Load Defl. (in)	0.521 @ 0	0.708	Passed (2L/244)	--	1.0 D + 1.0 Lr (Alt Spans)

System : Roof
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD
Member Pitch: 0/12

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (2L/240) and TL (2L/180).
- Top Edge Bracing (Lu): Top compression edge must be braced at 13' 0.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13' 0.00" o/c unless detailed otherwise.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Stud wall - DF	5.50"	5.50"	1.92"	3074	3226	6300	Blocking
2 - Stud wall - DF	5.50"	5.50"	1.50"	-966	-1167	-2133	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 13'	N/A	18.5		
1 - Uniform (PSF)	0 to 13' (Front)	2' 0.00"	15.0	20.0	Roof
2 - Point (lb)	0 (Front)	N/A	1478	1620	Linked from: RB7, Support 2

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

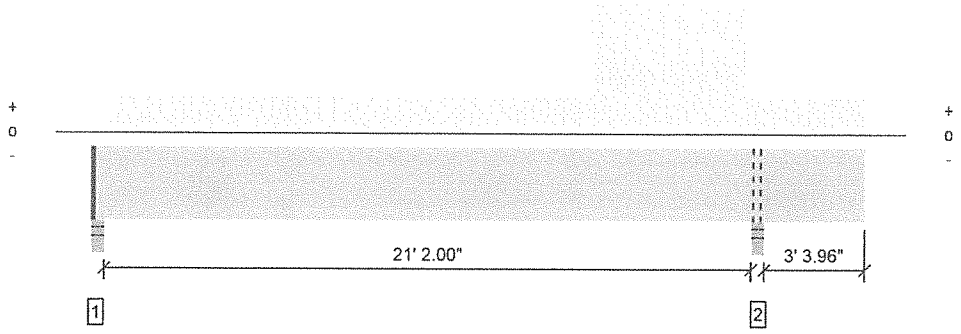
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

6/13/2018 2:07:35 PM
Forte v5.3, Design Engine: V7.0.0.5
18-122 REDESIGN.4te

2 piece(s) 2 x 12 Douglas Fir-Larch No. 2 @ 16" OC

Overall Length: 25' 0.96"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1010 @ 21' 7.25"	6563 (3.50")	Passed (15%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	760 @ 20' 6.25"	4050	Passed (19%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2458 @ 15' 10.64"	5458	Passed (45%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	-0.148 @ 25' 0.96"	0.232	Passed (2L/562)	--	1.0 D + 0.75 L + 0.75 Lr (Alt Spans)
Total Load Defl. (in)	-0.241 @ 25' 0.96"	0.348	Passed (2L/346)	--	1.0 D + 0.75 L + 0.75 Lr (Alt Spans)
TJ-Pro™ Rating	N/A	N/A	--	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 17' 1.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 25' 0.00" o/c unless detailed otherwise.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.50"	226	92	269	587	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	3.50"	1.50"	375	575	270	1220	Blocking

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.
- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
1 - Uniform (PSF)	0 to 16' 2.00"	16"	15.0	-	20.0	Roof
2 - Uniform (PSF)	16' 2.00" to 21' 2.00"	16"	30.0	100.0	-	Balcony
3 - Uniform (PSF)	21' 2.00" to 25' 0.96"	16"	15.0	-	20.0	Roof

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

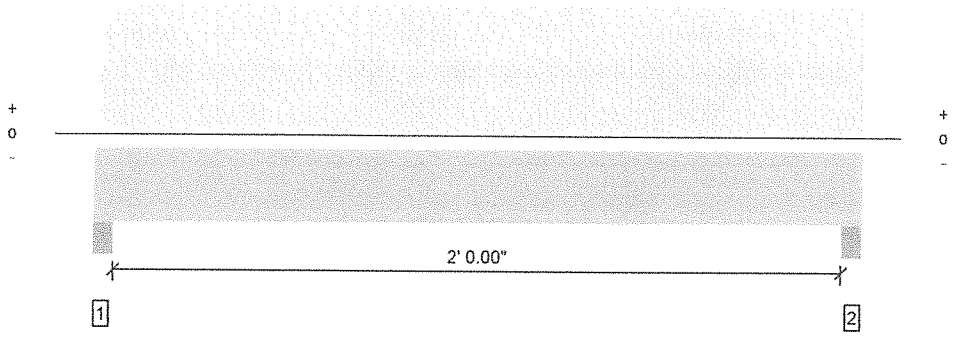
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

6/13/2018 3:54:26 PM
Forte v5.3, Design Engine: V7.0.0.5
18-122 REDESIGN.4te

1 piece(s) 4 x 6 Douglas Fir-Larch No. 2 (Plank)

Overall Length: 2' 11.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1751 @ 4.00"	18906 (5.50")	Passed (9%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	847 @ 9.00"	2310	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	756 @ 1' 5.50"	1150	Passed (66%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.010 @ 1' 5.50"	0.075	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.022 @ 1' 5.50"	0.112	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation with vertical (gravity) loads applied to wide strand face.
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 11.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	936	807	280	2023	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	936	807	280	2023	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 11.00"	N/A	4.9			
1 - Uniform (PSF)	0 to 2' 11.00"	10' 0.00"	16.0	-	-	Wall
2 - Uniform (PSF)	0 to 2' 11.00"	9' 7.00"	24.0	-	20.0	Roof
3 - Uniform (PSF)	0 to 2' 11.00"	6' 9.00"	24.0	40.0	-	Floor
4 - Uniform (PSF)	0 to 2' 11.00"	2' 10.00"	30.0	100.0	-	Balcony

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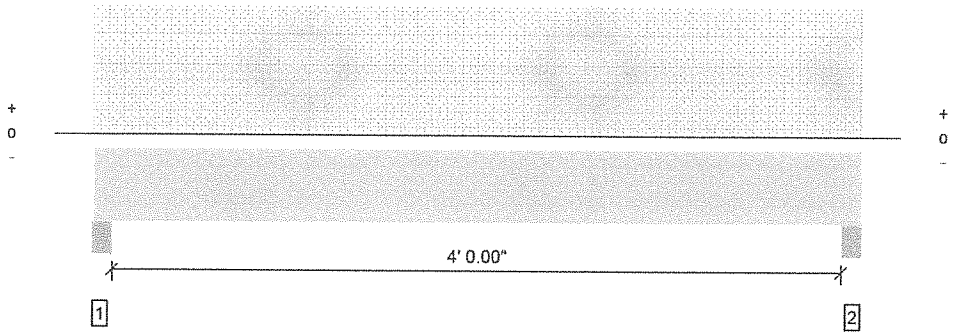
Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 6 x 6 Douglas Fir-Larch No. 1

Overall Length: 4' 11.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2958 @ 4.00"	18906 (5.50")	Passed (16%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	1847 @ 11.00"	3428	Passed (54%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2705 @ 2' 5.50"	2773	Passed (98%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.034 @ 2' 5.50"	0.142	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.072 @ 2' 5.50"	0.213	Passed (L/704)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	1585	1360	471	3416	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	1585	1360	471	3416	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 11.00"	N/A	7.7			
1 - Uniform (PSF)	0 to 4' 11.00"	10' 0.00"	16.0	-	-	Wall
2 - Uniform (PSF)	0 to 4' 11.00"	9' 7.00"	24.0	-	20.0	Roof
3 - Uniform (PSF)	0 to 4' 11.00"	6' 9.00"	24.0	40.0	-	Floor
4 - Uniform (PSF)	0 to 4' 11.00"	2' 10.00"	30.0	100.0	-	Balcony

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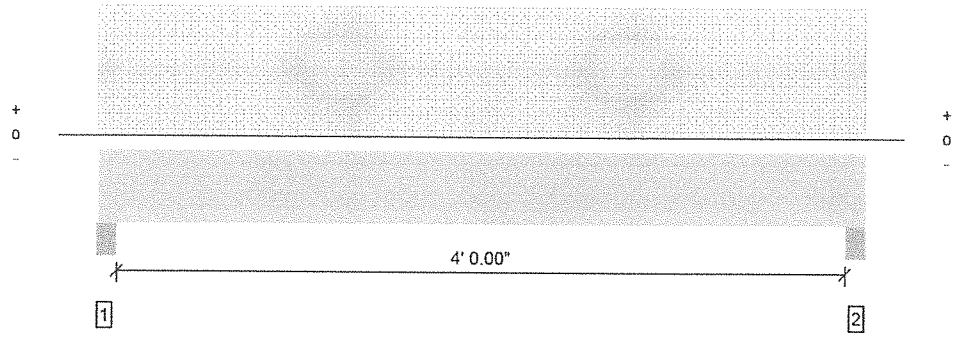
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 6 x 6 Douglas Fir-Larch No. 1

Overall Length: 4' 11.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1822 @ 4.00"	18906 (5.50")	Passed (10%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	1095 @ 11.00"	3428	Passed (32%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1604 @ 2' 5.50"	2773	Passed (58%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.017 @ 2' 5.50"	0.142	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.045 @ 2' 5.50"	0.213	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	1140	606	303	2049	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	1140	606	303	2049	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 11.00"	N/A	7.7			
1 - Uniform (PSF)	0 to 4' 11.00"	6' 2.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 4' 11.00"	10' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 4' 11.00"	6' 2.00"	24.0	-	20.0	Roof

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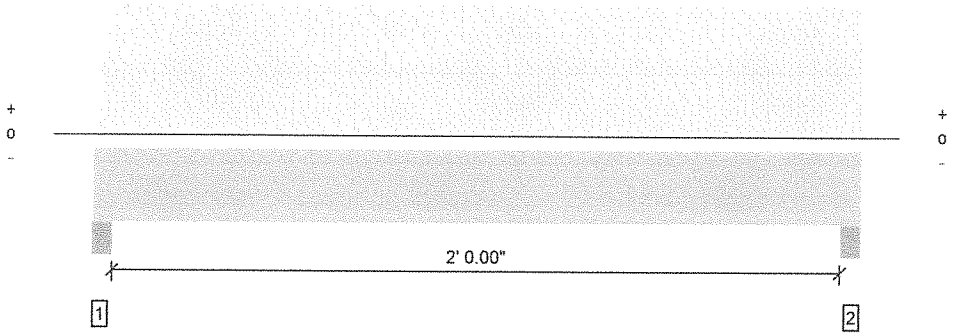
Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 4 x 6 Douglas Fir-Larch No. 2 (Plank)

Overall Length: 2' 11.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1077 @ 4.00"	18906 (5.50")	Passed (6%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	501 @ 9.00"	2310	Passed (22%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	448 @ 1' 5.50"	1150	Passed (39%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.005 @ 1' 5.50"	0.075	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.014 @ 1' 5.50"	0.112	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation with vertical (gravity) loads applied to wide strand face.
- Top Edge Bracing (Lu): Top compression edge must be braced at 2' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 2' 11.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	672	360	180	1212	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	672	360	180	1212	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 2' 11.00"	N/A	4.9			
1 - Uniform (PSF)	0 to 2' 11.00"	6' 2.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 2' 11.00"	10' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 2' 11.00"	6' 2.00"	24.0	-	20.0	Roof

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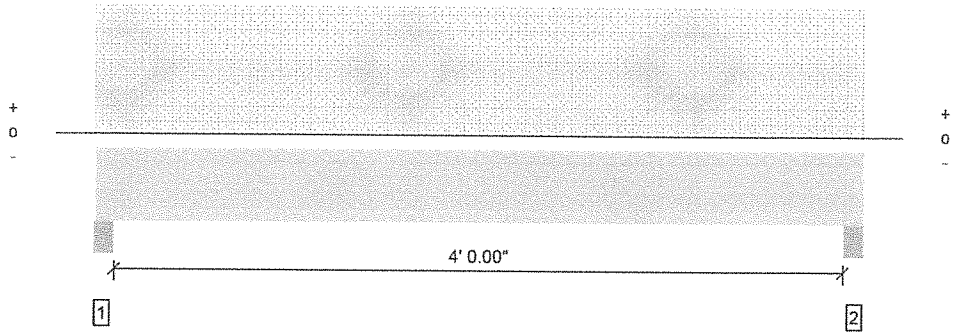
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 4 x 6 Douglas Fir-Larch No. 2 (Plank)

Overall Length: 4' 11.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	710 @ 4.00"	18906 (5.50")	Passed (4%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	482 @ 9.00"	2310	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	637 @ 2' 5.50"	1150	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.014 @ 2' 5.50"	0.142	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.067 @ 2' 5.50"	0.213	Passed (L/756)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation with vertical (gravity) loads applied to wide strand face.
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 11.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	563	131	66	760	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	563	131	66	760	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 11.00"	N/A	4.9			
1 - Uniform (PSF)	0 to 4' 11.00"	1' 4.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 4' 11.00"	10' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 4' 11.00"	1' 4.00"	24.0	-	20.0	Roof

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

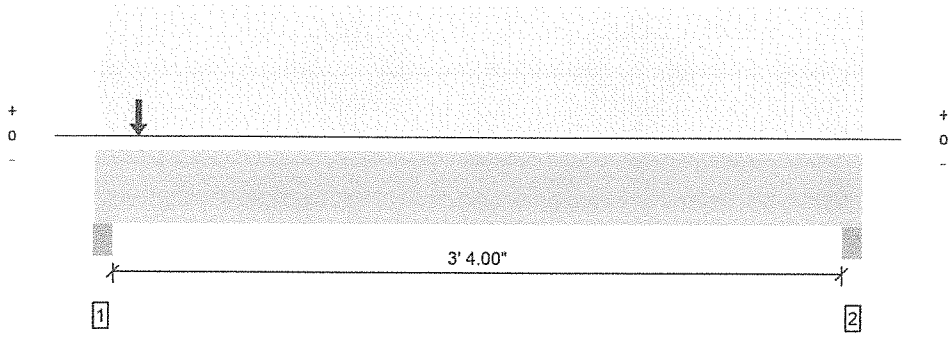
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

6/13/2018 2:07:35 PM
Forte v5.3, Design Engine: V7.0.0.5
18-122 REDESIGN.4te

1 piece(s) 4 x 6 Douglas Fir-Larch No. 2 (Plank)

Overall Length: 4' 3.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5052 @ 4.00"	18906 (5.50")	Passed (27%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	549 @ 9.00"	2310	Passed (24%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	641 @ 2' 1.50"	1150	Passed (56%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.014 @ 2' 1.50"	0.119	Passed (L/999+)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.049 @ 2' 1.50"	0.179	Passed (L/883)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Member has been designed in flat (plank) orientation with vertical (gravity) loads applied to wide strand face.
- Top Edge Bracing (Lu): Top compression edge must be braced at 4' 3.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 4' 3.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	2793	2008	1003	5804	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	622	227	113	962	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 4' 3.00"	N/A	4.9			
1 - Uniform (PSF)	0 to 4' 3.00"	2' 8.00"	24.0	40.0	-	Residential - Living Areas
2 - Uniform (PSF)	0 to 4' 3.00"	10' 0.00"	16.0	-	-	Wall
3 - Uniform (PSF)	0 to 4' 3.00"	2' 8.00"	24.0	-	20.0	Roof
4 - Point (lb)	3.00"	N/A	2171	1781	890	Linked from: FB1, Support 2

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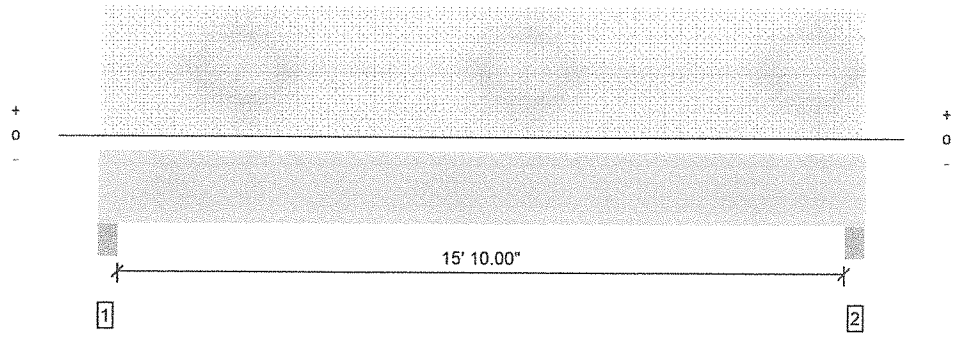
Forte Software Operator	Job Notes
KENNETH NAZARETH DCA (000) 000-0000 kenneth@dca-se.com	

1 piece(s) 6 x 10 Douglas Fir-Larch No. 1

Overall Length: 16' 9.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1942 @ 4.00"	18906 (5.50")	Passed (10%)	--	1.0 D + 1.0 Lr (All Spans)
Shear (lbs)	1462 @ 1' 3.00"	5330	Passed (27%)	0.90	1.0 D (All Spans)
Moment (Ft-lbs)	6636 @ 8' 4.50"	8376	Passed (79%)	0.90	1.0 D (All Spans)
Live Load Defl. (in)	0.071 @ 8' 4.50"	0.536	Passed (L/999+)	--	1.0 D + 1.0 Lr (All Spans)
Total Load Defl. (in)	0.617 @ 8' 4.50"	0.804	Passed (L/313)	--	1.0 D + 1.0 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 16' 9.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 16' 9.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	1719	223	1942	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	1719	223	1942	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 16' 9.00"	N/A	13.2		
1 - Uniform (PSF)	0 to 16' 9.00"	10' 0.00"	16.0	-	Wall
2 - Uniform (PSF)	0 to 16' 9.00"	1' 4.00"	24.0	20.0	Roof

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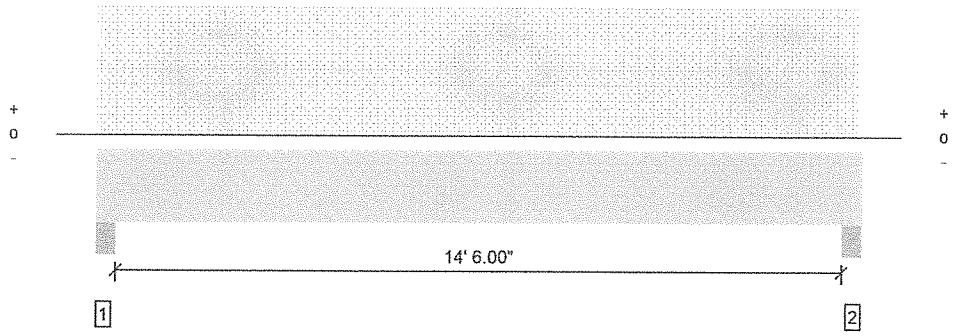
The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

1 piece(s) 5 1/4" x 11 1/4" 2.2E Parallam® PSL

Overall Length: 15' 5.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	5974 @ 4.00"	18047 (5.50")	Passed (33%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	4614 @ 1' 4.75"	11419	Passed (40%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	19879 @ 7' 8.50"	26955	Passed (74%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.392 @ 7' 8.50"	0.492	Passed (L/451)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.640 @ 7' 8.50"	0.738	Passed (L/277)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 15' 5.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 15' 5.00" o/c unless detailed otherwise.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.82"	2310	3324	1561	7195	None
2 - Trimmer - DF	5.50"	5.50"	1.80"	2287	3288	1544	7119	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 15' 5.00"	N/A	18.5			
1 - Uniform (PLF)	0 to 15' 4.00"	N/A	281.3	431.3	202.5	Linked from: RJ3, Support 2

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Forte Software Operator	Job Notes
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6/13/2018 3:54:39 PM
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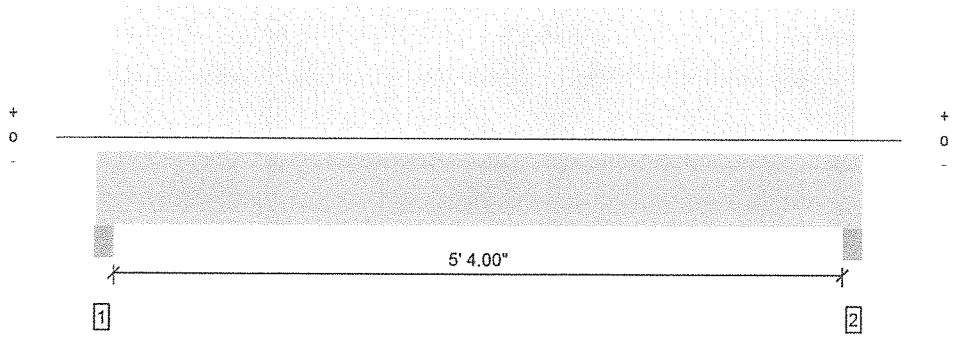
18-122 REDESIGN.4te

FORTE MEMBER REPORT *Floor, H18* **34 PASSED**

1 piece(s) 6 x 6 Douglas Fir-Larch No. 1

Overall Length: 6' 3.00"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2388 @ 4.00"	18906 (5.50")	Passed (13%)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Shear (lbs)	1590 @ 11.00"	3428	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2806 @ 3' 1.50"	2773	Passed (101%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.085 @ 3' 1.50"	0.186	Passed (L/787)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)
Total Load Defl. (in)	0.137 @ 3' 1.50"	0.279	Passed (L/489)	--	1.0 D + 0.75 L + 0.75 Lr (All Spans)

System : Wall
Member Type : Header
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6' 3.00" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 6' 3.00" o/c unless detailed otherwise.
- Applicable calculations are based on NDS.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Total	
1 - Trimmer - DF	5.50"	5.50"	1.50"	903	1348	633	2884	None
2 - Trimmer - DF	5.50"	5.50"	1.50"	880	1312	616	2808	None

Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Roof Live (non-snow: 1.25)	Comments
0 - Self Weight (PLF)	0 to 6' 3.00"	N/A	7.7			
1 - Uniform (PLF)	0 to 6' 2.00"	N/A	281.3	431.3	202.5	Linked from: RJ3, Support 2

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SUSTAINABLE FORESTRY INITIATIVE

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6/13/2018 3:54:52 PM
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18-122 REDESIGN.4te

WOOD FRAMING - LATERAL

USGS Design Maps Summary Report

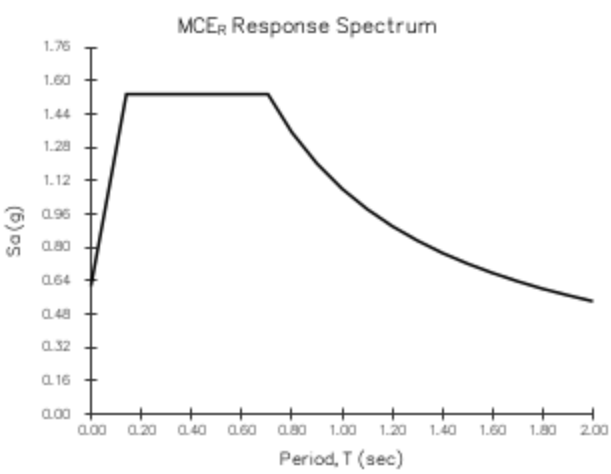
User–Specified Input

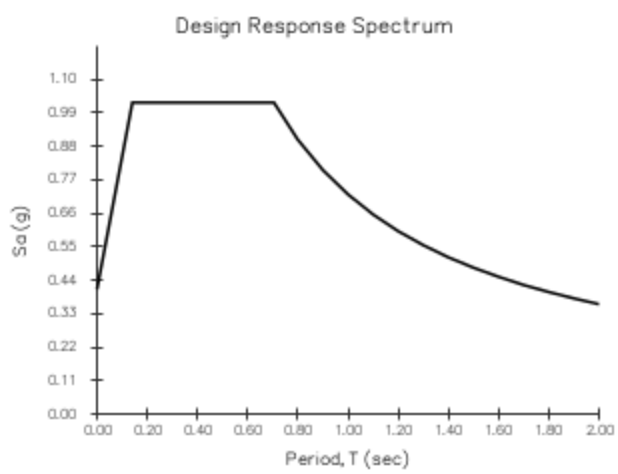
Report Title	KENSINGTON CAMPUS Thu March 8, 2018 19:38:16 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	34.67433°N, 118.18809°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	1.536 g	S_{MS} =	1.536 g	S_{DS} =	1.024 g
S_1 =	0.722 g	S_{M1} =	1.082 g	S_{D1} =	0.722 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

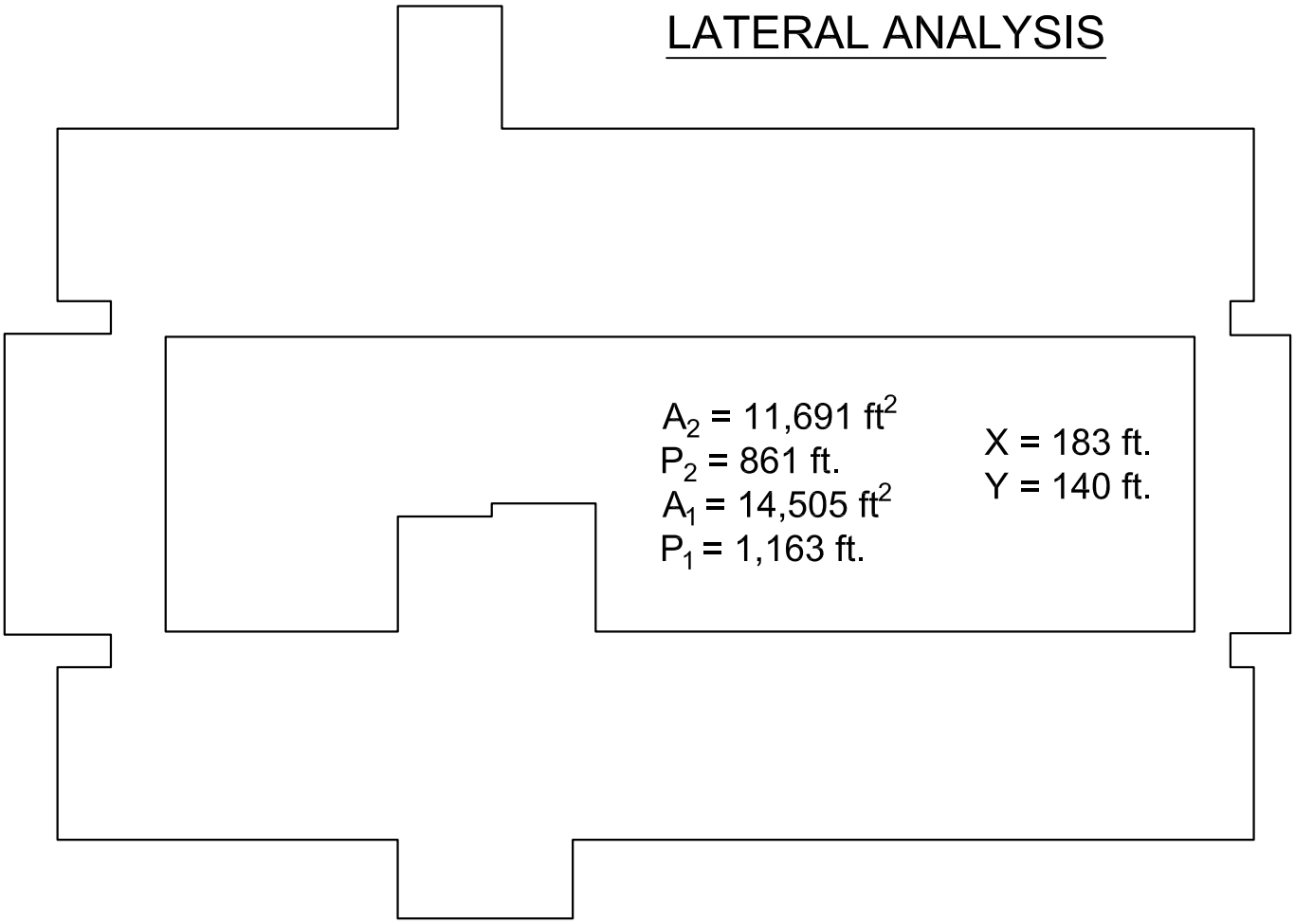




For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

LATERAL ANALYSIS



SEISMIC BASE SHEAR

(ASCE 7-10)

(Table 20.3-1) SITE CLASS: D

(Table 12.2-1) R = 6.5

S_s = 1.54 g

(11.4-1) $S_{MS} = F_a S_s$
= 1.00 x 1.54
= 1.54

(11.4-3) $S_{DS} = (2/3)S_{MS}$
= (2/3) x 1.5
= 1.024 g

S_1 = 0.72 g

(11.4-2) $S_{M1} = F_v S_1$
= 1.50 x 0.72
= 1.083

(11.4-4) $S_{D1} = (2/3)S_{M1}$
= (2/3)x 1.1
= 0.722 g

(12.8-7) $T_a = C_t h_n^x$
= $0.02 \times 28^{0.75}$
= 0.2434

(12.8-1) V = Cs W

(12.8-7) $V_{MIN} = 0.044 S_{DS} I_e W = 0.0451 \geq 0.01 W$

(12.8-6) $V_{MIN} = \frac{0.5\, S_1}{(R/I_e)} W$ (For $S_1 \geq 0.6g$)

$= \frac{0.5 \times 0.722}{6.5 / 1.0} W = 0.056 W$

V_{MIN} = 0.056 W

(12.8-3) $V_{MAX} = \frac{S_{D1}\, I_e}{(T \cdot R)} W = \frac{0.722 \times 1.0}{0.243 \times 6.5} W = 0.4563 W$

(12.8-2) $V = \frac{S_{DS}}{(R/I_e)} W = \frac{1.024}{6.5 / 1.0} \times W = 0.158 W$ <~~GOVERNS

(12.8-7) $V = Cs \cdot \rho W = 0.158 \times 1 W = 0.158 W$

V = 0.158 W [LRFD]

V = 0.7 x 0.158 W

V = 0.11 W [ASD]

SEISMIC ANALYSIS

WEIGHT

LEVEL-2

Wroof	=	(24	psf	+	3.0	psf)	x	11691	ft^2	=	315.7	kips
Wwall	=	16	psf	x	10	ft /2	x	861	ft	=	68.9	kips
									W2	=	384.5	kips

LEVEL-1

Wfloor	=	(25	psf	+	6.0	psf)	x	14505	ft^2	=	449.7	kips
Wwall abv	=	16	psf	x	10	ft /2	x	861	ft	=	68.9	kips
Wwall blw	=	16	psf	x	10	ft /2	x	1163	ft	=	93.0	kips
									W1	=	611.6	kips
									W_{TOTAL}	=	996.1	kips

BASE SHEAR

V_{BASE} = 0.11 x W_{TOTAL}

V_{BASE} = 0.111 x 996.1 = **110.57** kips

DISTRIBUTION OF BASE SHEAR

$$F2 = 110.6 \times \frac{384.5 \times 20}{\#\# \times 20 + 612 \times 10} = \mathbf{61.59} \text{ kips}$$

$$F1 = 110.6 \times \frac{611.6 \times 10}{\#\# \times 20 + 612 \times 10} = \mathbf{48.98} \text{ kips}$$

lbs/sq ft
5.268
3.377

DIAPHRAGM FORCES

Floor	F_{px} (psf)	F_{px} min (psf)	F_{px} max (psf)	Use: F_{px}
Roof	5.268	6.736	13.472	6.736
Floor 2	3.377	8.635	17.270	8.635

DAVID CHOI & ASSOCIATES

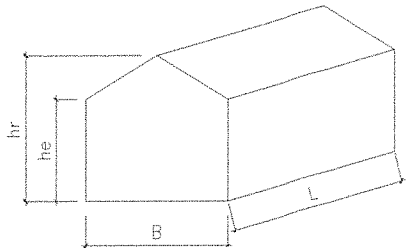
PROJECT : KENSINGTON CAMPUS
CLIENT :
JOB NO. : 18-122 DATE : 06/13/18

PAGE :
DESIGN BY :
REVIEW BY :

Wind Analysis for Low-rise Building, Based on ASCE 7-10 / IBC 2012 / CBC 2013

INPUT DATA

Exposure category (B, C or D)		C	
Importance factor	I =	1.00	Category II
Basic wind speed	V =	110	mph
Topographic factor	K_{zt} =	1	Flat
Building height to eave	h_e =	22	ft
Building height to ridge	h_r =	22	ft
Building length	L =	183	ft
Building width	B =	140	ft
Effective area of components	A =	100	ft^2



DESIGN SUMMARY

Max horizontal force normal to building length, L, face	=	70.27 kips	x 0.6 =	42.16 kips
Max horizontal force normal to building length, B, face	=	54.52 kips	x 0.6 =	32.71 kips
Max total horizontal torsional load	=	1538.78 ft-kips		
Max total upward force	=	459.68 kips		

ANALYSIS

0.7E = 110.6 ft

GOVERNS

Velocity pressure

$q_h = 0.00256\ K_h K_{zt} K_d V^2 I$ = **24.12** psf

where: q_h = velocity pressure at mean roof height, h.

K_h = velocity pressure exposure coefficient evaluated at height, h, = **0.92**

K_d = wind directionality factor = **0.85**

h = mean roof height = **22.00** ft

< 60 ft, [Satisfactory]

Design pressures for MWFRS

$p = q_h\ [(G\ C_{pf}) - (G\ C_{pi})]$

where: p = pressure in appropriate zone

$G\ C_{pf}$ = product of gust effect factor and external pressure coefficient

$G\ C_{pi}$ = product of gust effect factor and internal pressure coefficient

= **0.18** or **-0.18**

a = width of edge strips, MAX[MIN(0.1B, 0.4h), 0.04B,3] = **8.80 ft**

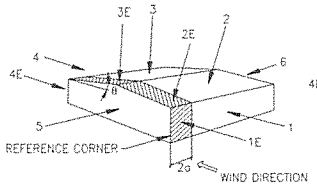
Net Pressures (psf), Basic Load Cases

Surface	Roof angle θ = 0.00			Roof angle θ = 0.00		
	$G\ C_{pf}$	Net Pressure with		$G\ C_{pf}$	Net Pressure with	
		$(+GC_{pi})$	$(-GC_{pi})$		$(+GC_{pi})$	$(-GC_{pi})$
1	0.40	5.31	13.99	0.40	5.31	13.99
2	-0.69	-20.98	-12.30	-0.69	-20.98	-12.30
3	-0.37	-13.26	-4.58	-0.37	-13.26	-4.58
4	-0.29	-11.34	-2.65	-0.29	-11.34	-2.65
1E	0.61	10.37	19.05	0.61	10.37	19.05
2E	-1.07	-30.15	-21.46	-1.07	-30.15	-21.46
3E	-0.53	-17.12	-8.44	-0.53	-17.12	-8.44
4E	-0.43	-14.71	-6.03	-0.43	-14.71	-6.03
5	-0.45	-15.19	-6.51	-0.45	-15.19	-6.51
6	-0.45	-15.19	-6.51	-0.45	-15.19	-6.51

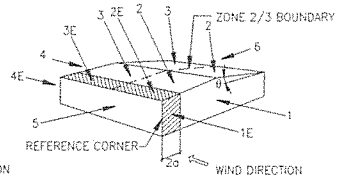
Net Pressures (psf), Torsional Load Cases

Surface	Roof angle θ = 0.00		
	$G\ C_{pf}$	Net Pressure with	
		$(+GC_{pi})$	$(-GC_{pi})$
1T	0.40	1.33	3.50
2T	-0.69	-5.25	-3.08
3T	-0.37	-3.32	-1.15
4T	-0.29	-2.83	-0.66

Surface	Roof angle θ = 0.00		
	$G\ C_{pf}$	Net Pressure with	
		$(+GC_{pi})$	$(-GC_{pi})$
1T	0.40	1.33	3.50
2T	-0.69	-5.25	-3.08
3T	-0.37	-3.32	-1.15
4T	-0.29	-2.83	-0.66

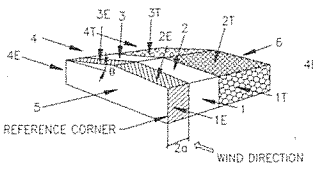


Transverse Direction

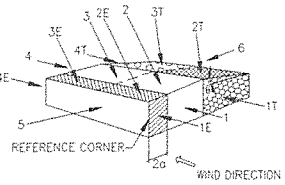


Longitudinal Direction

Basic Load Cases



Transverse Direction



Longitudinal Direction

Torsional Load Cases

Basic Load Cases in Transverse Direction

Surface	Area (ft^2)	Pressure (k) with ($+GC_{pi}$)	Pressure (k) with ($-GC_{pi}$)
1	3639	19.31	50.90
2	11578	-242.94	-142.41
3	11578	-153.58	-53.06
4	3639	-41.25	-9.65
1E	387	4.02	7.38
2E	1232	-37.14	-26.44
3E	1232	-21.10	-10.40
4E	387	-5.70	-2.33
Σ	Horiz.	70.27	70.27
	Vert.	-454.75	-232.31
10 psf min.	Horiz.	40.26	40.26
Sec. 6.1.4.1	Vert.	-256.20	-256.20

Basic Load Cases in Longitudinal Direction

Surface	Area (ft^2)	Pressure (k) with ($+GC_{pi}$)	Pressure (k) with ($-GC_{pi}$)
1	2693	14.29	37.67
2	11200	-235.00	-137.76
3	11200	-148.56	-51.32
4	2693	-30.52	-7.14
1E	387	4.02	7.38
2E	1610	-48.55	-34.57
3E	1610	-27.58	-13.59
4E	387	-5.70	-2.33
Σ	Horiz.	54.52	54.52
	Vert.	-459.68	-237.24
10 psf min.	Horiz.	30.80	30.80
Sec. 6.1.4.1	Vert.	-256.20	-256.20

Torsional Load Cases in Transverse Direction

Surface	Area (ft^2)	Pressure (k) with ($+GC_{pi}$)	Pressure (k) with ($-GC_{pi}$)	Torsion (ft-k) ($+GC_{pi}$)	Torsion (ft-k) ($-GC_{pi}$)
1	1626	8.63	22.74	357	940
2	5173	-108.54	-63.63	0	0
3	5173	-68.62	-23.70	0	0
4	1626	-18.43	-4.31	762	178
1E	387	4.02	7.38	332	610
2E	1232	-37.14	-26.44	0	0
3E	1232	-21.10	-10.40	0	0
4E	387	-5.70	-2.33	471	193
1T	2013	2.67	7.04	-122	-322
2T	6405	-33.60	-19.70	0	0
3T	6405	-21.24	-7.34	0	0
4T	2013	-5.70	-1.34	-261	-61
Total Horiz. Torsional Load, M_T				1539	1539

Torsional Load Cases in Longitudinal Direction

Surface	Area (ft^2)	Pressure (k) with ($+GC_{pi}$)	Pressure (k) with ($-GC_{pi}$)	Torsion (ft-k) ($+GC_{pi}$)	Torsion (ft-k) ($-GC_{pi}$)
1	1153	6.12	16.13	160	422
2	9589	-201.21	-117.95	0	0
3	9589	-127.20	-43.94	0	0
4	1153	-13.07	-3.06	342	80
1E	387	4.02	7.38	246	451
2E	1610	-48.55	-34.57	0	0
3E	1610	-27.58	-13.59	0	0
4E	387	-5.70	-2.33	349	143
1T	1540	2.04	5.39	-71	-188
2T	11200	-58.75	-34.44	0	0
3T	11200	-37.14	-12.83	0	0
4T	1540	-4.36	-1.02	-153	-36
Total Horiz. Torsional Load, M_T				872.8	872.8

Design pressures for components and cladding

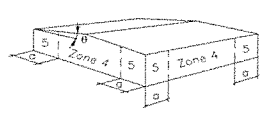
$p = q_h[(G\,C_p) - (G\,C_{pi})]$

where: p = pressure on component

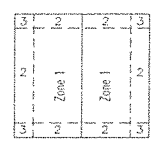
p_{min} = 10 psf (Sec. 6.1.4.2, pg 21)

$G\,C_p$ = external pressure coefficient.

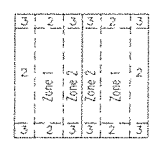
see table below



Walls



Roof $\theta \le 7°$



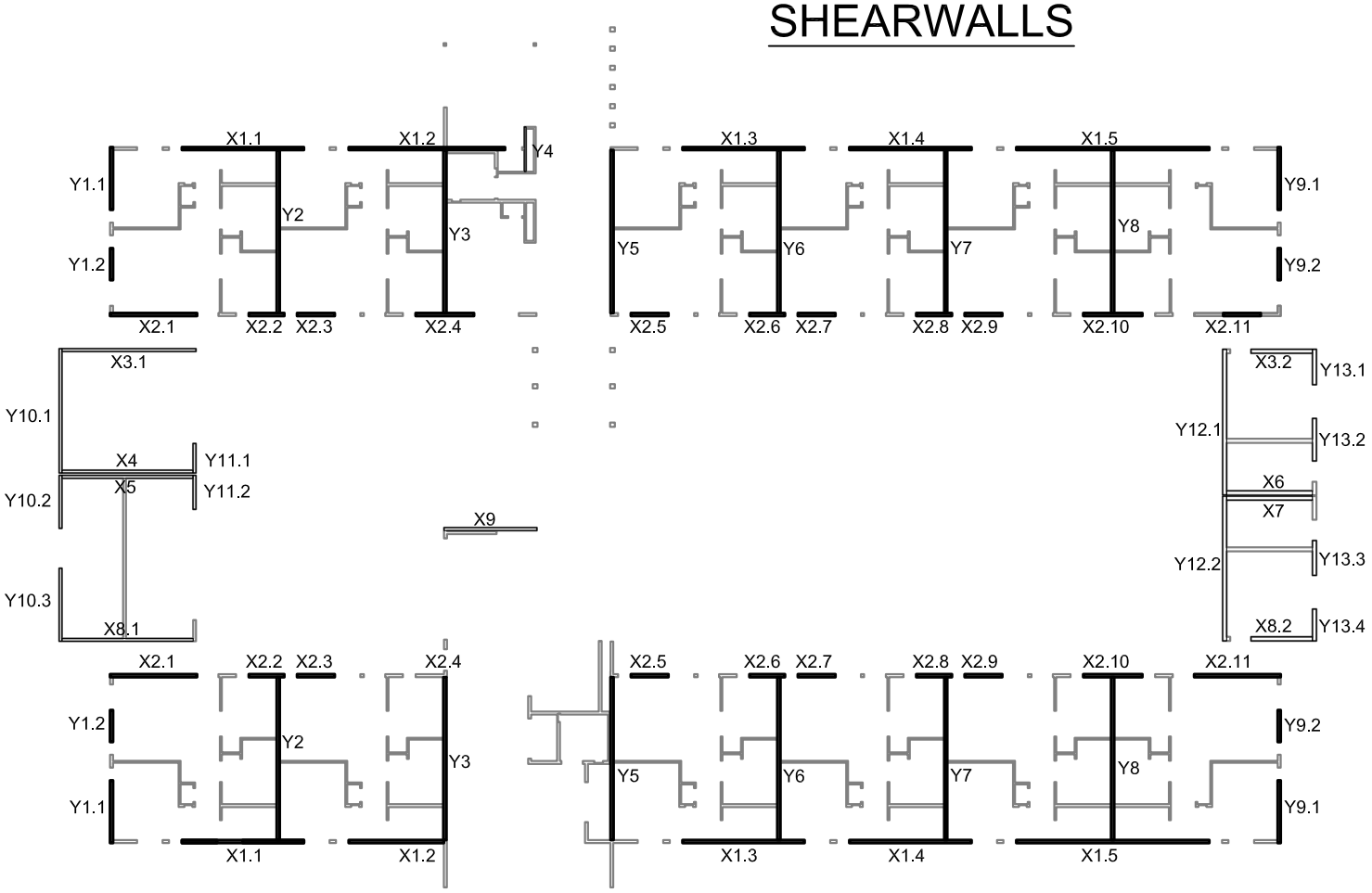
Roof $\theta > 7°$

	Effective Area (ft^2)	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5	
		GC_p	$-GC_p$	GC_p	$-GC_p$	GC_p	$-GC_p$	GC_p	$-GC_p$	GC_p	$-GC_p$
Comp.	100	0.20	-0.90	0.20	-1.10	0.20	-1.10	0.74	-0.83	0.74	-0.94

(Walls reduced 10 %, Fig. 6-11A note 5.)

Comp. & Cladding Pressure (psf)	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
	10.00	-26.05	10.00	-30.87	10.00	-30.87	22.21	-24.39	22.21	-27.06

SHEARWALLS


X1.1
X1.2
Y4
X1.3
X1.4
X1.5
Y1.1
Y2
Y3
Y5
Y6
Y7
Y8
Y9.1
Y1.2
Y9.2
X2.1
X2.2
X2.3
X2.4
X2.5
X2.6
X2.7
X2.8
X2.9
X2.10
X2.11
X3.1
X3.2
Y13.1
Y10.1
Y12.1
Y13.2
X4
Y11.1
X5
Y11.2
Y10.2
X6
X7
X9
Y12.2
Y13.3
Y10.3
X8.1
X8.2
Y13.4
X2.1
X2.2
X2.3
X2.4
X2.5
X2.6
X2.7
X2.8
X2.9
X2.10
X2.11
Y1.2
Y2
Y3
Y5
Y6
Y7
Y8
Y9.2
Y1.1
Y9.1
X1.1
X1.2
X1.3
X1.4
X1.5

Forces to Shear Walls in the WEST-EAST direction (X-Dir.)

ROOF SHEAR ON LEVEL 2 WALLS

E = 5.27 psf

Wall ID	Force Abv. (lbs)	AREA	F (lbs)	F_{total} (lbs)	Shearwall Length (ft)	v=F/b	Wall TAG	V_{allow}	Over-strength
X1	0	2416	12732	12732	110.25	115	A	340	2.94
X2	0	3430	18076	18076	74.25	243	A	340	1.40
X3	0	0	0	0					
X4	0	0	0	0					
X5	0	0	0	0					
X6	0	0	0	0					
X7	0	0	0	0					
X8	0	0	0	0					
X9	0	0	0	0					
SUMMATION	0	5846	30808	30808					

Forces to Shear Walls in the WEST-EAST direction (X-Dir.)

LEVEL 2 SHEAR ON LEVEL 1 WALLS

E = 3.38 psf

Wall ID	Force Abv. (lbs)	AREA	F (lbs)	F_{total} (lbs)	Shearwall Length (ft)	v=F/b	Wall TAG	V_{allow}	Over-strength
X1	12732	2714	9173	21906	110.25	199	A	340	1.71
X2	18076	2868	9694	27770	74.25	374	B	510	1.36
X3	0	885	2991	2991	30.25	99	A	340	3.44
X4	0	245	828	828	20.25	41	A	340	8.31
X5	0	325	1099	1099	20.25	54	A	340	6.27
X6	0	169	571	571	13.25	43	A	340	7.89
X7	0	167	564	564	13.25	43	A	340	7.98
X8	0	1139	3850	3850	29.75	129	A	340	2.63
X9	0	390	1318	1318	14.25	93	A	340	3.68
SUMMATION	30808	7206	24356	55165					

Forces to Shear Walls in the NORTH-SOUTH direction (Y-Dir.)

ROOF SHEAR ON LEVEL 2 WALLS

E = 5.27 psf

Wall ID	Force Abv. (lbs)	AREA	F (lbs)	F_{total} (lbs)	Shearwall Length (ft)	v=F/b	Wall TAG	V_{allow}	Over-strength
Y1	0	376	1982	1982	14.25	139	A	340	2.45
Y2	0	843	4443	4443	25.33	175	A	340	1.94
Y3	0	851	4485	4485	25.33	177	A	340	1.92
Y4									
Y5	0	845	4453	4453	25.33	176	A	340	1.93
Y6	0	837	4411	4411	25.33	174	A	340	1.95
Y7	0	844	4448	4448	25.33	176	A	340	1.94
Y8	0	843	4443	4443	25.33	175	A	340	1.94
Y9	0	407	2145	2145	14.25	151	A	340	2.26
Y10									
Y11									
Y12									
Y13									
SUMMATION	0	1219	6424	6424					

Forces to Shear Walls in the NORTH-SOUTH direction (Y-Dir.)

LEVEL 2 SHEAR ON LEVEL 1 WALLS

E = 3.38 psf

Wall ID	Force Abv. (lbs)	AREA	F (lbs)	F_{total} (lbs)	Shearwall Length (ft)	v=F/b	Wall TAG	V_{allow}	Over-strength
Y1	1982	177	598	2580	14.25	181	A	340	1.88
Y2	4443	623	2106	6548	25.33	259	A	340	1.32
Y3	4485	738	2494	6979	25.33	276	A	340	1.23
Y4	0	600	2028	2028	7.00	290	A	340	1.17
Y5	4453	632	2136	6589	25.33	260	A	340	1.31
Y6	4411	824	2785	7196	25.33	284	A	340	1.20
Y7	4448	831	2809	7257	25.33	286	A	340	1.19
Y8	4443	695	2349	6792	25.33	268	A	340	1.27
Y9	2145	123	416	2561	14.25	180	A	340	1.89
Y10	0	499	1687	1687	38.33	44	A	340	7.73
Y11	0	1442	4874	4874	9.50	513	C	665	1.30
Y12	0	1166	3941	3941	45.00	88	A	340	3.88
Y13	0	335	1132	1132	21.91	52	A	340	6.58
SUMMATION	6424	800	2704	9128					

TIE DOWN & HOLD-DOWN DESIGN
2ND FLOOR

SW HT.= 9.5 ft

SW ID	SW length	Unit Shear Abv.	SW Unit Shear	Roof Trib.	Net Uplift	ATS/HDS	Net Comp.	H_{EFF} (ft.)	2L/H	ν Adjusted	Wall Tag
X1.1	19.5	0	115	6	-57	HDS1	1097	9.5	4.11	115	A
X1.2	24	0	115	6	-324	HDS1	1097	9.5	5.05	115	A
X1.3	18.5	0	115	6	2	HDS1	1097	9.5	3.89	115	A
X1.4	18.5	0	115	6	2	HDS1	1097	9.5	3.89	115	A
X1.5	29.75	0	115	6	-664	HDS1	1097	9.5	6.26	115	A
X2.1	13	0	243	6	1543	HDS2	2313	9.5	2.74	243	A
X2.2	5.25	0	243	6	2002	HDS3	2313	9.5	1.11	243	A
X2.3	5.5	0	243	6	1987	HDS3	2313	9.5	1.16	243	A
X2.4	8.75	0	243	6	1795	HDS3	2313	9.5	1.84	243	A
X2.5	5.5	0	243	6	1987	HDS3	2313	9.5	1.16	243	A
X2.6	5.25	0	243	6	2002	HDS3	2313	9.5	1.11	243	A
X2.7	5.5	0	243	6	1987	HDS3	2313	9.5	1.16	243	A
X2.8	5.25	0	243	6	2002	HDS3	2313	9.5	1.11	243	A
X2.9	5.5	0	243	6	1987	HDS3	2313	9.5	1.16	243	A
X2.10	9	0	243	6	1780	HDS3	2313	9.5	1.89	243	A
X2.11	5.75	0	243	6	1972	HDS3	2313	9.5	1.21	243	A
X3.1	20.75	0									
X3.2	9.5	0									
X4	20.25	0									
X5	20.25	0									
X6	13.25	0									
X7	13.25	0									
X8.1	20.25	0									
X8.2	9.5	0									
X9	14.25	0									

TIE DOWN/HOLD-DOWN DESIGN
1ST FLOOR

SW HT.= 9.5 ft

SW ID	SW length	Unit Shear Abv.	Unit Shear at Floor	Floor Trib	Net Uplift	ATS/HDS	Net Comp.	H_{EFF} (ft.)	2L/H	ν Adjusted	Wall Tag
X1.1	19.5	115	199	6	629	HDU2	2985	9.5	4.11	199	A
X1.2	24	115	199	6	85	HDU2	2985	9.5	5.05	199	A
X1.3	18.5	115	199	6	750	HDU2	2985	9.5	3.89	199	A
X1.4	18.5	115	199	6	750	HDU2	2985	9.5	3.89	199	A
X1.5	29.75	115	199	6	-609	HDU2	2985	9.5	6.26	199	A
X2.1	13	243	374	6	4295	HDU4	5866	9.5	2.74	374	B
X2.2	5.25	243	374	6	5232	HDU5	5866	9.5	1.11	374	B
X2.3	5.5	243	374	6	5201	HDU5	5866	9.5	1.16	374	B
X2.4	8.75	243	374	6	4809	HDU5	5866	9.5	1.84	374	B
X2.5	5.5	243	374	6	5201	HDU5	5866	9.5	1.16	374	B
X2.6	5.25	243	374	6	5232	HDU5	5866	9.5	1.11	374	B
X2.7	5.5	243	374	6	5201	HDU5	5866	9.5	1.16	374	B
X2.8	5.25	243	374	6	5232	HDU5	5866	9.5	1.11	374	B
X2.9	5.5	243	374	6	5201	HDU5	5866	9.5	1.16	374	B
X2.10	9	243	374	6	4779	HDU5	5866	9.5	1.89	374	B
X2.11	5.75	243	374	6	5171	HDU5	5866	9.5	1.21	374	B
X3.1	20.75	0	99	2	93	HDU2	939	9.5	4.37	99	A
X3.2	9.5	0	99	2	552	HDU2	939	9.5	2.00	99	A
X4	20.25	0	41	2	-438	HDU2	388	9.5	4.26	41	A
X5	20.25	0	54	2	-311	HDU2	515	9.5	4.26	54	A
X6	13.25	0	43	2	-131	HDU2	410	9.5	2.79	43	A
X7	13.25	0	43	2	-136	HDU2	405	9.5	2.79	43	A
X8.1	20.25	0	129	2	403	HDU2	1229	9.5	4.26	129	A
X8.2	9.5	0	129	2	842	HDU2	1229	9.5	2.00	129	A
X9	14.25	0	93	2	297	HDU2	879	9.5	3.00	93	A

Note: all units is pound and feet

TIE DOWN/HOLD-DOWN DESIGN
2ND FLOOR

SW HT.= 9.5 ft

SW ID	SW length	Unit Shear Abv.	Unit Shear at Floor	Floor Trib	Net Uplift	ATS/HDS	Net Comp.	H_{EFF} (ft.)	2L/H	ν Adjusted	Wall Tag
Y1.1	9.5	0	139	2	941	HDS1	1321	9.5	2.00	139	A
Y1.2	4.75	0	139	2	1131	HDS1	1321	9.5	1.00	139	A
Y2	25.33	0	175	2	653	HDS1	1666	9.5	5.33	175	A
Y3	25.33	0	177	2	669	HDS1	1682	9.5	5.33	177	A
Y4	7	0	0								
Y5	25.33	0	176	2	657	HDS1	1670	9.5	5.33	176	A
Y6	25.33	0	174	2	641	HDS1	1654	9.5	5.33	174	A
Y7	25.33	0	176	2	655	HDS1	1668	9.5	5.33	176	A
Y8	25.33	0	175	2	653	HDS1	1666	9.5	5.33	175	A
Y9.1	9.5	0	151	2	1050	HDS1	1430	9.5	2.00	151	A
Y9.2	4.75	0	151	2	1240	HDS1	1430	9.5	1.00	151	A
Y10.1	19.33										
Y10.2	8										
Y10.3	11										
Y11.1	4.5										
Y11.2	5										
Y12.1	22.5										
Y12.2	22.5										
Y13.1	5.33										
Y13.2	6.5										
Y13.3	5.33										
Y13.4	4.75										

TIE DOWN/HOLD-DOWN DESIGN
1ST FLOOR

SW HT.= 9.5 ft

SW ID	SW length	Unit Shear Abv.	Unit Shear at Floor	Floor Trib	Net Uplift	ATS/HDS	Net Comp.	H_{EFF} (ft.)	2L/H	ν Adjusted	Wall Tag
Y1.1	9.5	139	181	2	2273	HDU2	3041	9.5	2.00	181	A
Y1.2	4.75	139	181	2	2657	HDU2	3041	9.5	1.00	181	A
Y2	25.33	175	259	2	2075	HDU2	4122	9.5	5.33	259	A
Y3	25.33	177	276	2	2253	HDU2	4300	9.5	5.33	276	A
Y4	7	0	290	2	2467	HDU2	2752	9.5	1.47	290	A
Y5	25.33	176	260	2	2095	HDU2	4141	9.5	5.33	260	A
Y6	25.33	174	284	2	2307	HDU2	4353	9.5	5.33	284	A
Y7	25.33	176	286	2	2343	HDU2	4390	9.5	5.33	286	A
Y8	25.33	175	268	2	2167	HDU2	4213	9.5	5.33	268	A
Y9.1	9.5	151	180	2	2369	HDU2	3137	9.5	2.00	180	A
Y9.2	4.75	151	180	2	2753	HDU2	3137	9.5	1.00	180	A
Y10.1	19.33	0	44	2	-371	HDU2	418	9.5	4.07	44	A
Y10.2	8	0	44	2	92	HDU2	418	9.5	1.68	44	A
Y10.3	11	0	44	2	-31	HDU2	418	9.5	2.32	44	A
Y11.1	4.5	0	513	2	4690	HDU5	4874	9.5	0.95	542	C
Y11.2	5	0	513	2	4670	HDU5	4874	9.5	1.05	513	C
Y12.1	22.5	0	88	2	-86	HDU2	832	9.5	4.74	88	A
Y12.2	22.5	0	88	2	-86	HDU2	832	9.5	4.74	88	A
Y13.1	5.33	0	52	2	273	HDU2	491	9.5	1.12	52	A
Y13.2	6.5	0	52	2	226	HDU2	491	9.5	1.37	52	A
Y13.3	5.33	0	52	2	273	HDU2	491	9.5	1.12	52	A
Y13.4	4.75	0	52	2	297	HDU2	491	9.5	1.00	52	A

Note: all units is pound and feet

MAT SLAB

License #*1PSA3VTLKFYW7FY

SAFE Analysis & Design Report

Prepared by

DCA

Model Name: KENSINGTON REDESIGN.fdb

13 June 2018

Model Definition

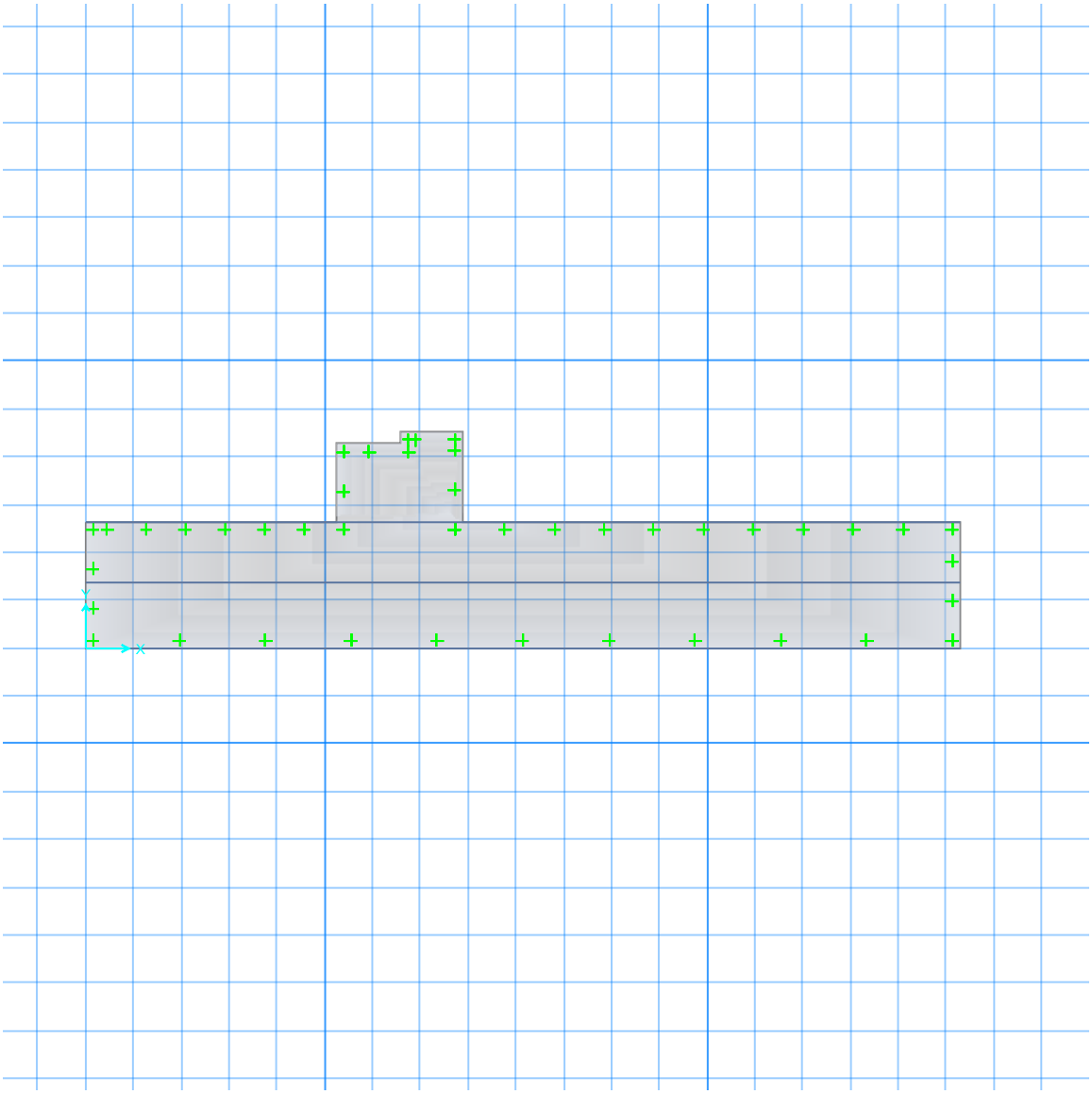


Figure 1: Finite element model

2. Model properties

This section provides model properties, including items such as material properties, section properties, and support properties.

2.1. Material properties

Table 2: Material Properties 03 - Concrete

Table 2: Material Properties 03 - Concrete

Material	E	U	A	UnitWt	Fc	LtWtConc	UserModRup
	kip/in2		1/F	lb/ft3	kip/in2		
4000Psi	3604.997	0.200000	5.5000E-06	1.5000E+02	4.000	No	No

Table 3: Material Properties 04 - Rebar

Table 3: Material Properties 04 - Rebar

Material	E	UnitWt	Fy	Fu
	kip/in2	lb/ft3	kip/in2	kip/in2
A615Gr60	29000.000	4.9000E+02	60.000	90.000

Table 4: Material Properties 05 - Tendon

Table 4: Material Properties 05 - Tendon

Material	E	UnitWt	Fy	Fu
	kip/in2	lb/ft3	kip/in2	kip/in2
A416Gr270	28500.000	4.9000E+02	245.100	270.000

Table 5: Material Properties 06 - Other

Table 5: Material Properties 06 - Other

Material	E	U	A	UnitWt
	kip/in2		1/F	lb/ft3
WOOD	1500.000	0.300000	4.5000E-06	3.5000E+01

2.2. Section properties

Table 6: Slab Properties 02 - Solid Slabs

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Slab	Type	MatProp	Thickness	Ortho
			in	
MAT	Mat	4000Psi	10.0000	No

Table 7: Beam Properties 02 - Rectangular Beam

Table 7: Beam Properties 02 - Rectangular Beam

Beam	MatProp	Depth	WidthTop	WidthBot
		in	in	in
BEAM1	4000Psi	24.0000	12.0000	12.0000

Table 8: Beam Properties 06 - Design Data

Table 8: Beam Properties 06 - Design Data

Beam	MatRebarL	MatRebarS	FlngWOpt	CoverTop	CoverBot	NoDesign
				in	in	
BEAM1	A615Gr60	A615Gr60	Analysis Property	3.0000	3.0000	No

Table 9: Wall Properties

Table 9: Wall Properties

Wall	MatProp	Thickness	AutoRigid	OutOfPlane
		in		
WOOD 6"	WOOD	6.0000	Yes	Yes

2.3. Support properties

Table 10: Soil Properties

Table 10: Soil Properties

Soil	Subgrade	NonlinOpt
	lb/ft3	
SOIL1	1.7280E+05	Compression Only

Table 11: Spring Properties - Point

Table 11: Spring Properties - Point

Spring	Ux	Uy	Uz	Rx	Ry	Rz	NonlinOpt
	kip/in	kip/in	kip/in	kip-in/rad	kip-in/rad	kip-in/rad	
PSPR1	0.0000	0.0000	0.0010	0.000	0.000	0.000	None (Linear)

Table 12: Spring Properties - Line

Table 12: Spring Properties - Line

Spring	VertStiff kip/in/in	RotStiff kip/rad	NonlinOpt
LSPR1	0.00100	0.0010	None (Linear)

3. Model assignments

This section provides model assignments, including assignments to slabs, beams, and joints.

3.1. Slab assignments

Table 13: Slab Property Assignments

Table 13: Slab Property Assignments

Area	SlabProp
2	MAT

3.2. Support assignments

Table 14: Soil Property Assignments

Table 14: Soil Property Assignments

Area	SoilProp
2	SOIL1

4. Model loading

This section provides model loading information, including load patterns, load cases, and load combinations.

4.1. Load patterns

Table 15: Load Patterns

Table 15: Load Patterns

LoadPat	Type	SelfWtMult
DEAD	DEAD	1.000000
LIVE	LIVE	0.000000

Table 16: Load Assignments - Surface Loads

Table 16: Load Assignments - Surface Loads

Area	LoadPat	Dir	UnifLoad	A	B	C
			lb/ft2	lb/ft3	lb/ft3	lb/ft2
2	DEAD	Gravity	5.00	0.0000E+00	0.0000E+00	0.00
2	LIVE	Gravity	40.00	0.0000E+00	0.0000E+00	0.00

Table 17: Load Assignments - Line Objects - Distributed Loads, Part 1 of 2

Table 17: Load Assignments - Line Objects - Distributed Loads, Part 1 of 2

Line	LoadPat	Type	Dir	RelDistA	RelDistB	AbsDistA	AbsDistB
						ft	ft
1	DEAD	Force	Gravity	0.0000	1.0000	0.0000	182.9960
1	LIVE	Force	Gravity	0.0000	1.0000	0.0000	182.9960
2	DEAD	Force	Gravity	0.0000	1.0000	0.0000	182.9960
2	LIVE	Force	Gravity	0.0000	1.0000	0.0000	182.9960
3	DEAD	Force	Gravity	0.0000	1.0000	0.0000	182.9960
3	LIVE	Force	Gravity	0.0000	1.0000	0.0000	182.9960

Table 17: Load Assignments - Line Objects - Distributed Loads, Part 2 of 2

Table 17: Load Assignments - Line Objects - Distributed Loads, Part 2 of 2

Line	LoadPat	FOverLA	FOverLB
		kip/ft	kip/ft
1	DEAD	0.632	0.632
1	LIVE	0.260	0.260
2	DEAD	0.784	0.784
2	LIVE	0.520	0.520
3	DEAD	0.784	0.784
3	LIVE	0.520	0.520

4.2. Load cases

Table 18: Load Cases 02 - Static

Table 18: Load Cases 02 - Static

LoadCase	InitialCond	AType
DEAD	Zero	Linear
LIVE	Zero	Linear

Table 19: Load Cases 06 - Loads Applied

Table 19: Load Cases 06 - Loads Applied

LoadCase	LoadPat	SF
DEAD	DEAD	1.000000
LIVE	LIVE	1.000000

4.3. Load combinations

Table 20: Load Combinations

Table 20: Load Combinations

Combo	Load	SF	Type	DSStrength	DSServInit	DSServNorm	DSServLong
1.2D+1.6L	DEAD	1.200000	Linear Add	Yes	No	No	No
1.2D+1.6L	LIVE	1.600000					
D+L	DEAD	1.000000	Linear Add	No	No	Yes	No
D+L	LIVE	1.000000					

Analysis Results

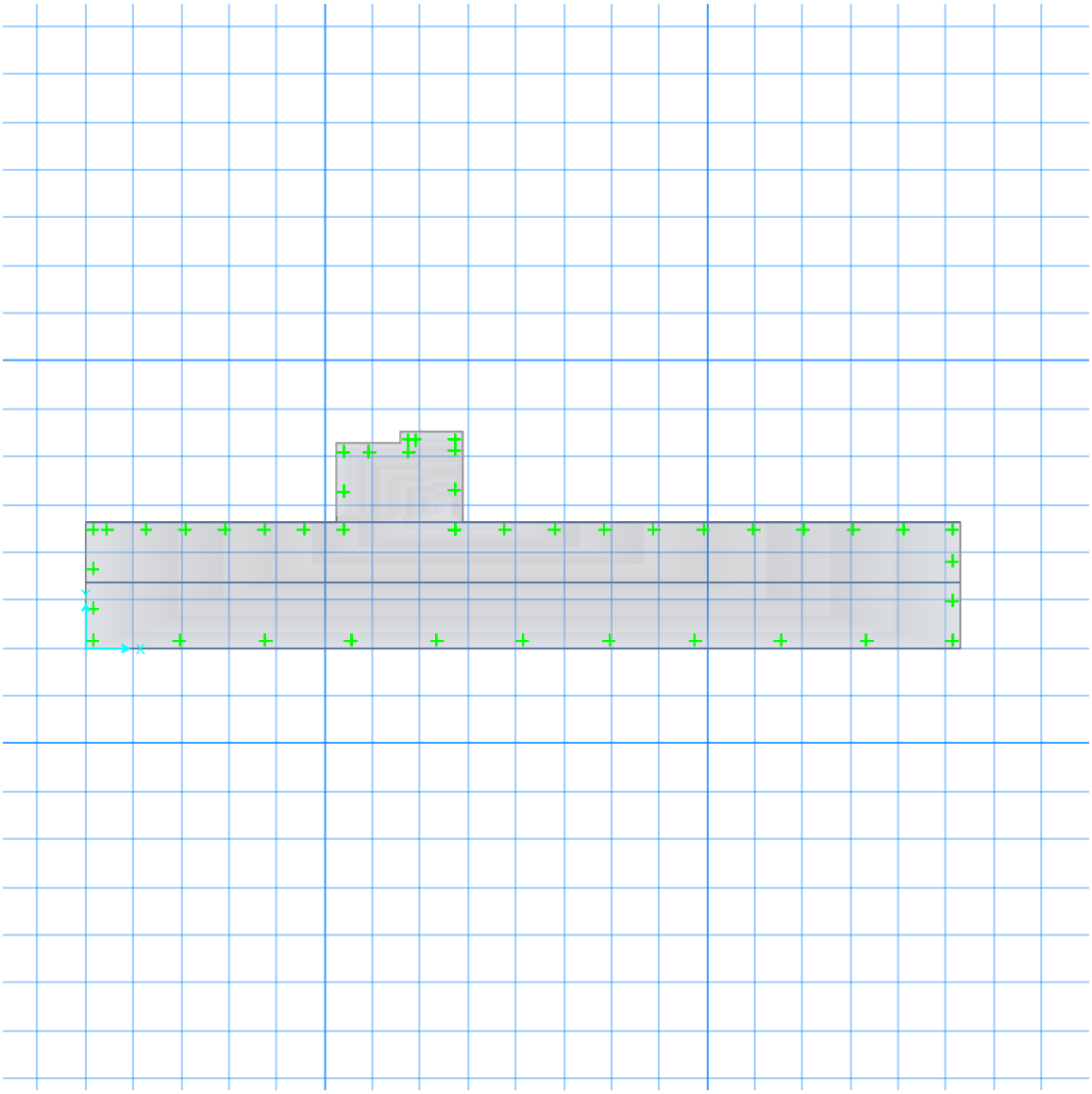


Figure 2: Deformed shape

Design

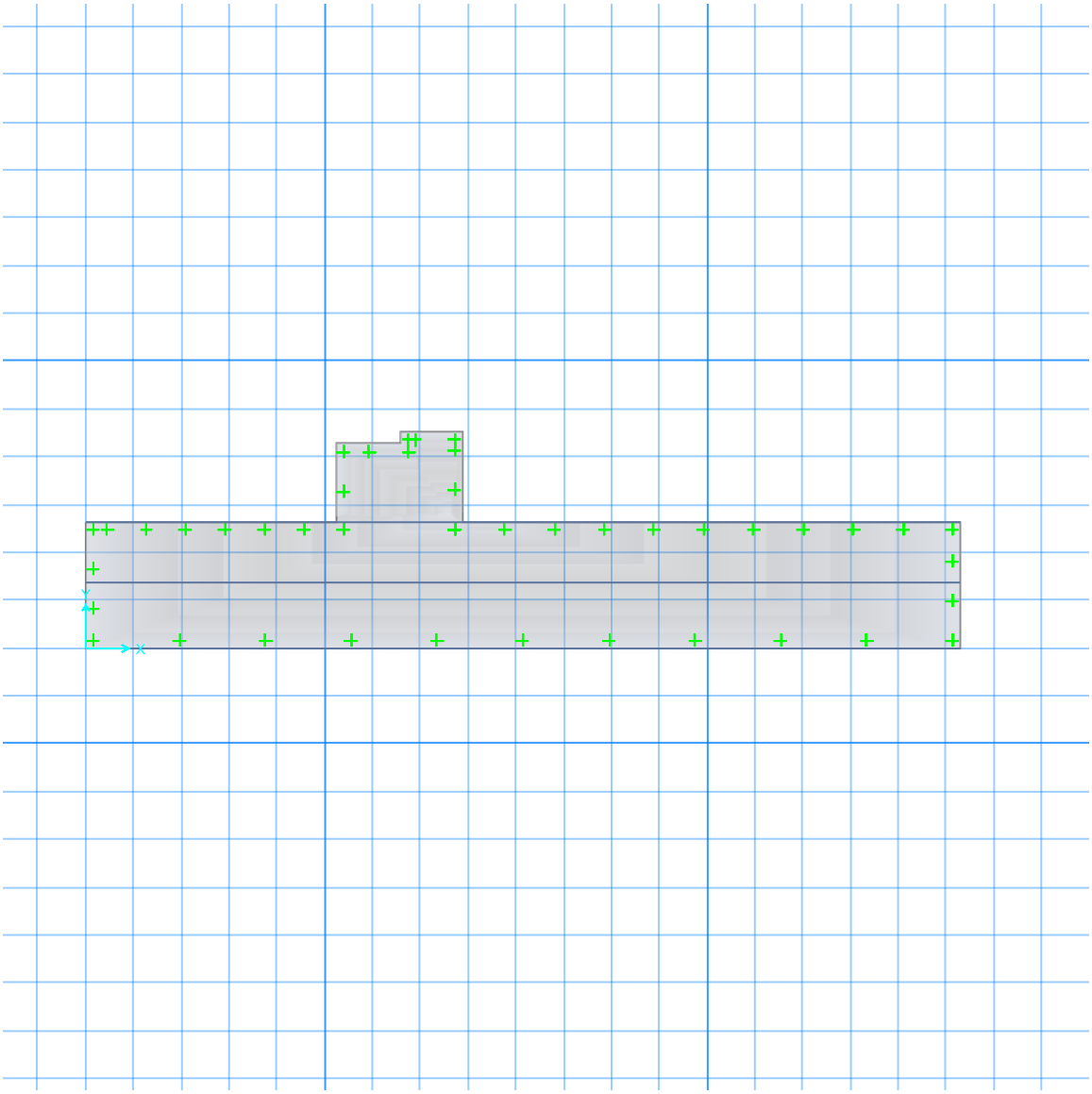


Figure 3: Finite element model

6. Design summary

This section provides design information for beams, strips, and punching checks.

6.1. Preferences

Table 24: Design Preferences 01 - Resistance Factors

Table 24: Design Preferences 01 - Resistance Factors

PhiTen	PhiComp	PhiShear
0.900000	0.650000	0.750000

Table 25: Design Preferences 02 - Rebar Cover - Slabs

Table 25: Design Preferences 02 - Rebar Cover - Slabs

CoverTop	CoverBot	BarSize	InnerLayer	PTCGSTop	PTCGSBotExt	PTCGSBotInt	SlabType
in	in			in	in	in	
0.7500	0.7500	#6	B	1.0000	1.7500	1.0000	Two Way

Table 26: Design Preferences 03 - Rebar Cover - Beams

Table 26: Design Preferences 03 - Rebar Cover - Beams

CoverTop	CoverBot	BarSizeF	BarSizeS	PTCGSTop	PTCGSBot
in	in			in	in
1.5000	1.5000	#9	#4	2.0000	2.0000

Table 27: Design Preferences 04 - Prestress Data

Table 27: Design Preferences 04 - Prestress Data

UserStress	InitConcRat	LLFraction
No	0.800000	0.500000

6.2. Overwrites

Table 28: Slab Design Overwrites 01 - Strip Based

Table 28: Slab Design Overwrites 01 - Strip Based

Strip	Layer	DesignType	RLLF	IgnorePT	RebarMat
CSA8	A	Column	1.000000	No	A615Gr60
CSA9	A	Column	1.000000	No	A615Gr60
CSB3	B	Column	1.000000	No	A615Gr60
CSB4	B	Column	1.000000	No	A615Gr60
CSB5	B	Column	1.000000	No	A615Gr60

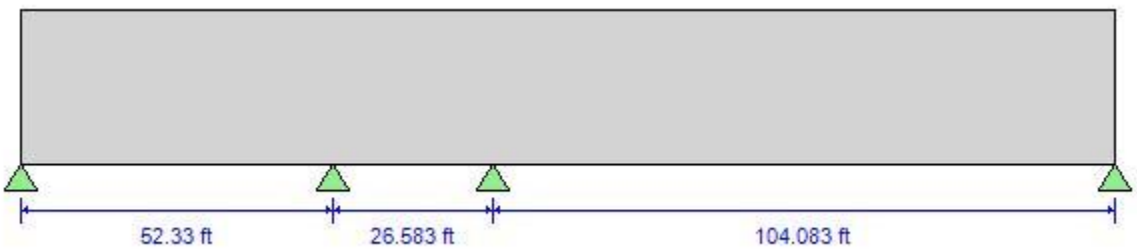
ACI 318-14 Concrete Strip Design

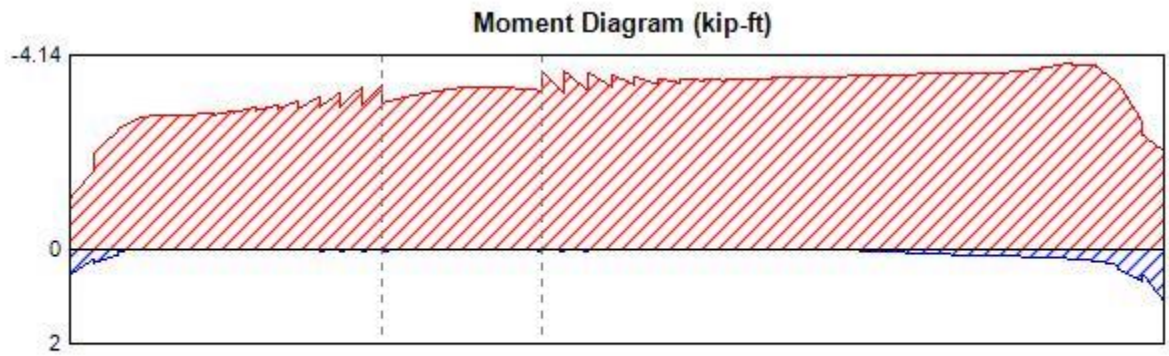
Geometric Properties

Combination = Overall Envelope
Strip Label = CSA8
Length = 192.5 ft
Distance to Top Rebar Center = 1.125 in
Distance to Bot Rebar Center = 1.125 in

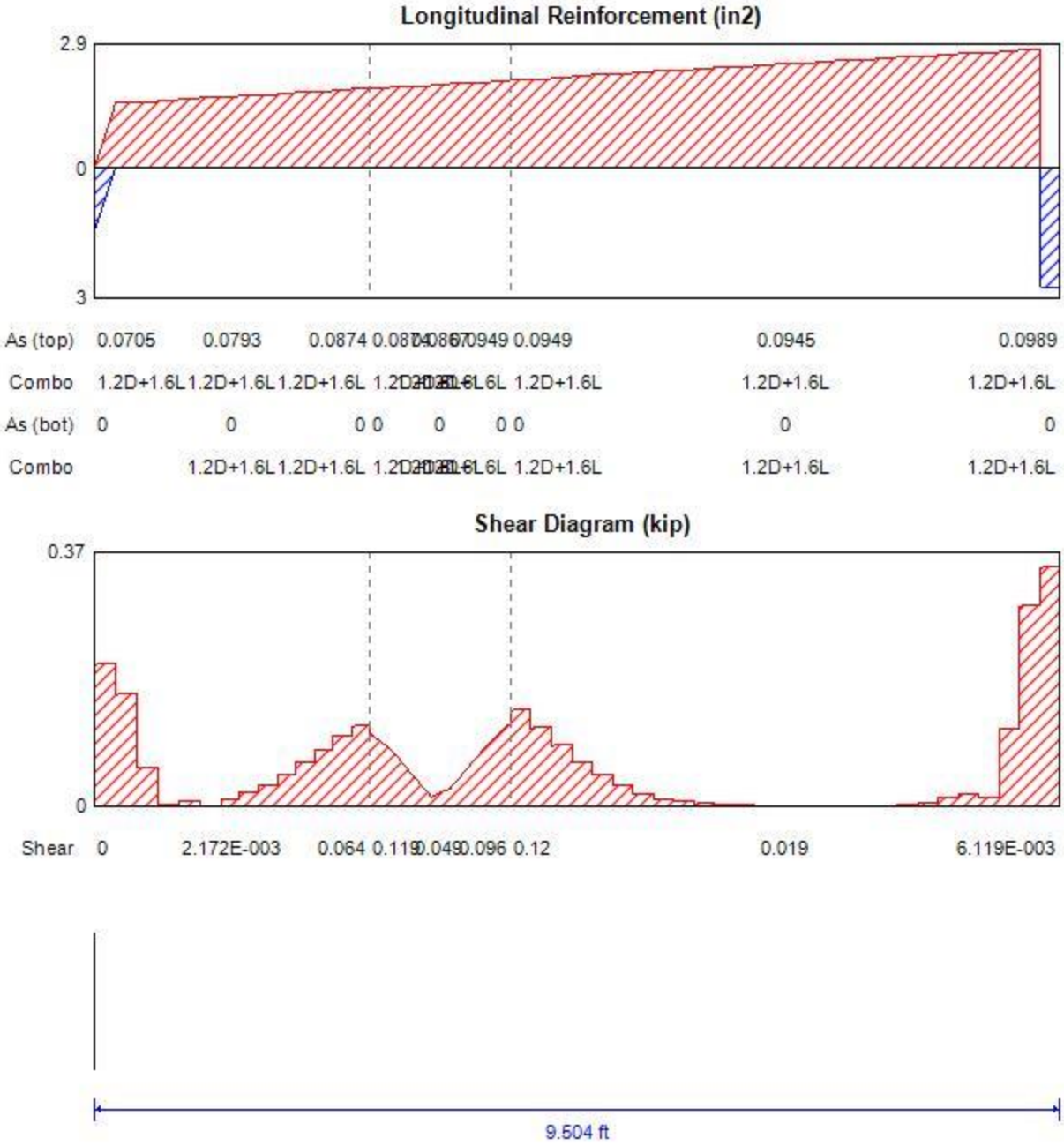
Material Properties

Concrete Comp. Strength = 4 kip/in2
Concrete Modulus = 3604.997 kip/in2
Longitudinal Rebar Yield = 60 kip/in2

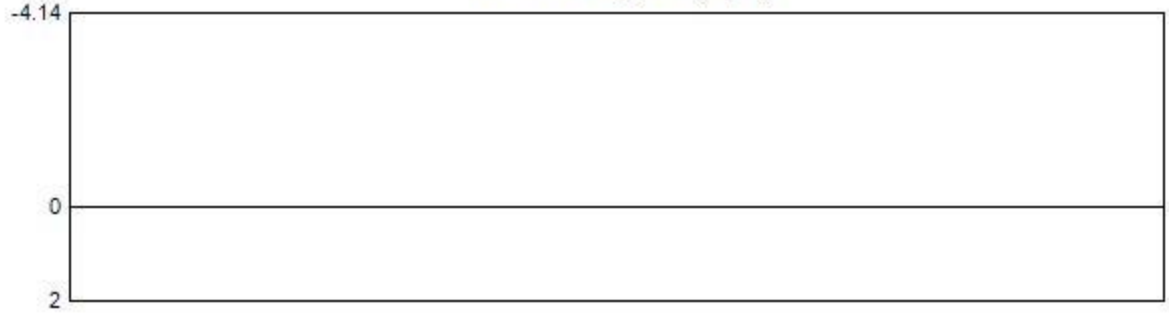




Moment (-)	-2.8141	-3.1636	-3.4895	-3.4[illegible]7874	-3.7874	-3.7733	-3.9456
Moment (+)	0	0	0 0	0	0 0.047	0	0.1655

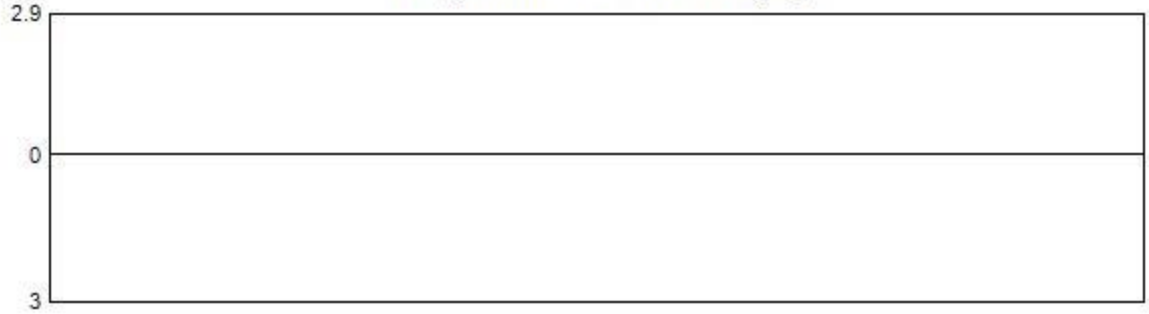

Longitudinal Reinforcement (in2)
2.9
0
3
As (top) 0.0705 0.0793 0.0874 0.0949 0.0945 0.0989
Combo 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L
As (bot) 0 0 0 0 0 0 0 0
Combo 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L 1.2D+1.6L
Shear Diagram (kip)
0.37
0
Shear 0 2.172E-003 0.064 0.119 0.049 0.096 0.12 0.019 6.119E-003
9.504 ft

Moment Diagram (kip-ft)



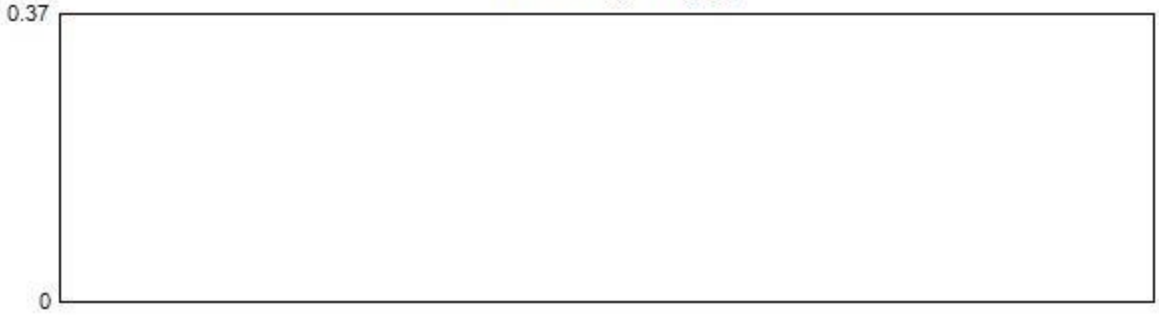
Moment (-)	-2.0897	0	0
Moment (+)	1.0971	0	0

Longitudinal Reinforcement (in2)



As (top)	0	0	0
Combo	1.2D+1.6L		
As (bot)	0	0	0
Combo	1.2D+1.6L		

Shear Diagram (kip)



Shear	0.349	0	0

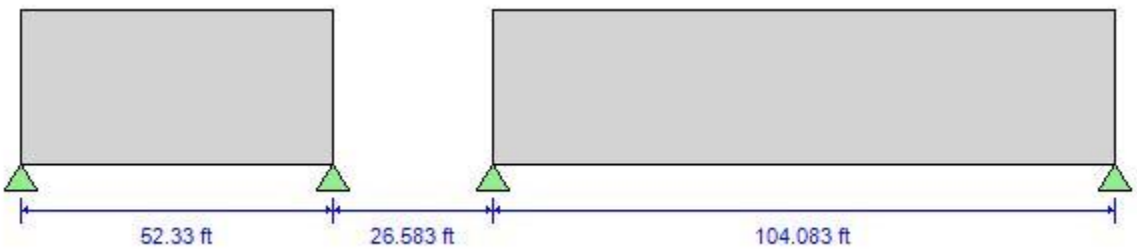
ACI 318-14 Concrete Strip Design

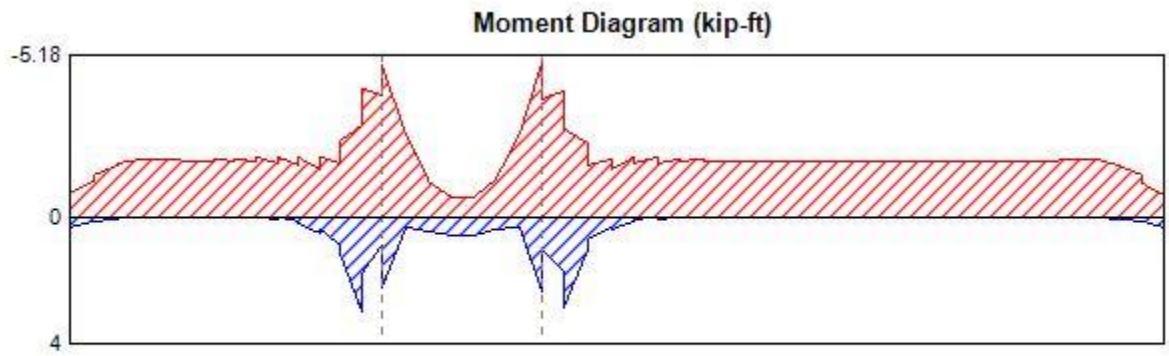
Geometric Properties

Combination = Overall Envelope
Strip Label = CSA9
Length = 187.5 ft
Distance to Top Rebar Center = 1.125 in
Distance to Bot Rebar Center = 1.125 in

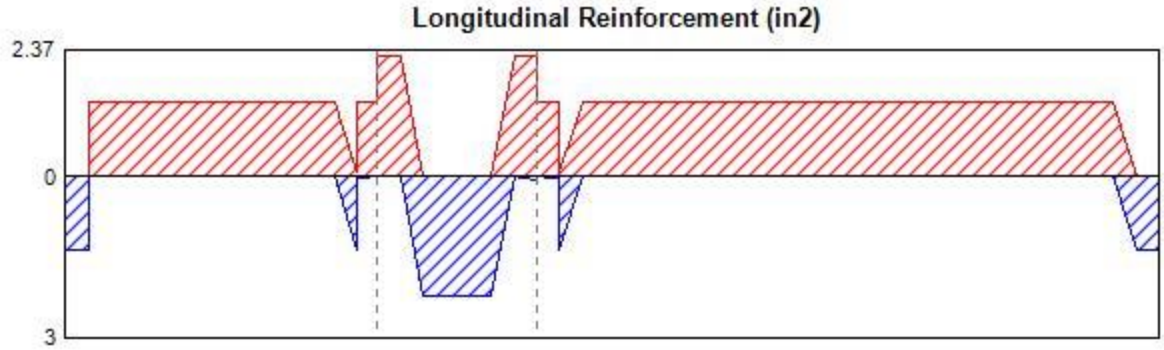
Material Properties

Concrete Comp. Strength = 4 kip/in2
Concrete Modulus = 3604.997 kip/in2
Longitudinal Rebar Yield = 60 kip/in2

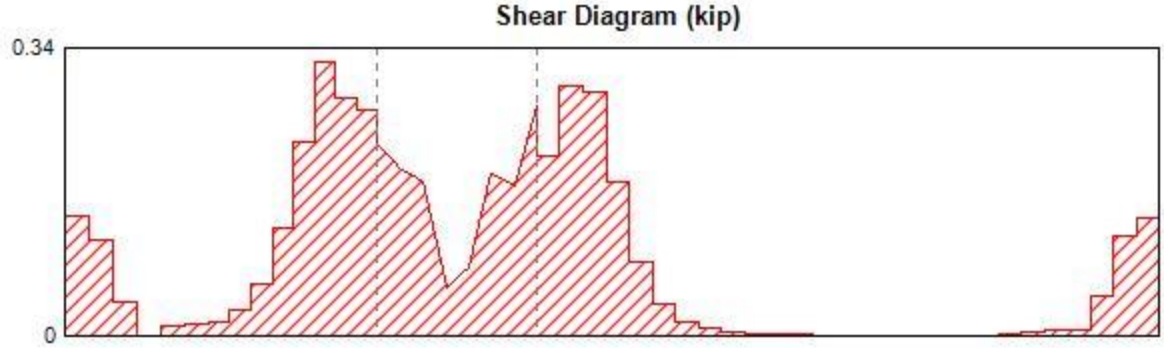




Moment (-)	-1.8334	-1.9199	-4.8731	-4.87	1.84	9309	-4.9309	-1.83	-1.8331
Moment (+)	0	0	2.9977	0.86	0242	273673	2.8845	0	0

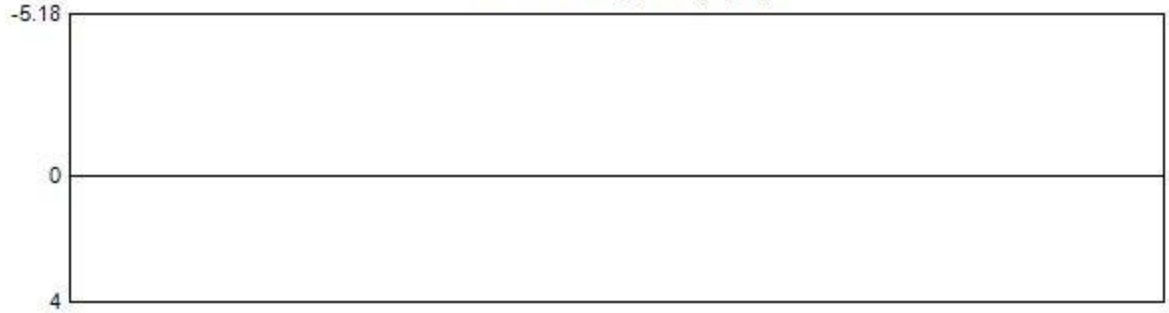


As (top)	0.0459	0.0481	0.1221	0.1221	0	0.1236	0.1236	0.0458	0.0459
Combo	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L
As (bot)	0	0	0.0751	0	0	0.0593	0.0723	0	0
Combo		1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L	1.2D+1.6L



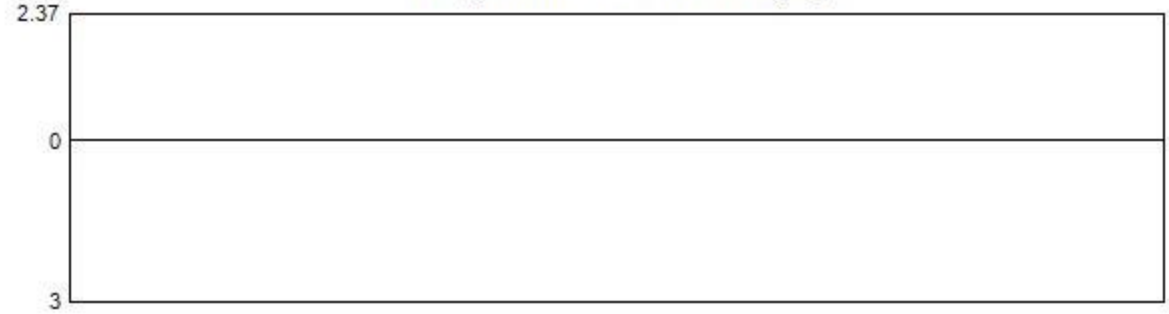
Shear	0	7.502E-005	0.229	0.267	0.182	0.177	0.272	0.017	2.033E-003

Moment Diagram (kip-ft)



Moment (-)	-0.7326	0	0
Moment (+)	0.3032	0	0

Longitudinal Reinforcement (in2)



As (top)	0	0	0
Combo	1.2D+1.6L		
As (bot)	0	0	0
Combo	1.2D+1.6L		

Shear Diagram (kip)

Shear	0.139	0	0

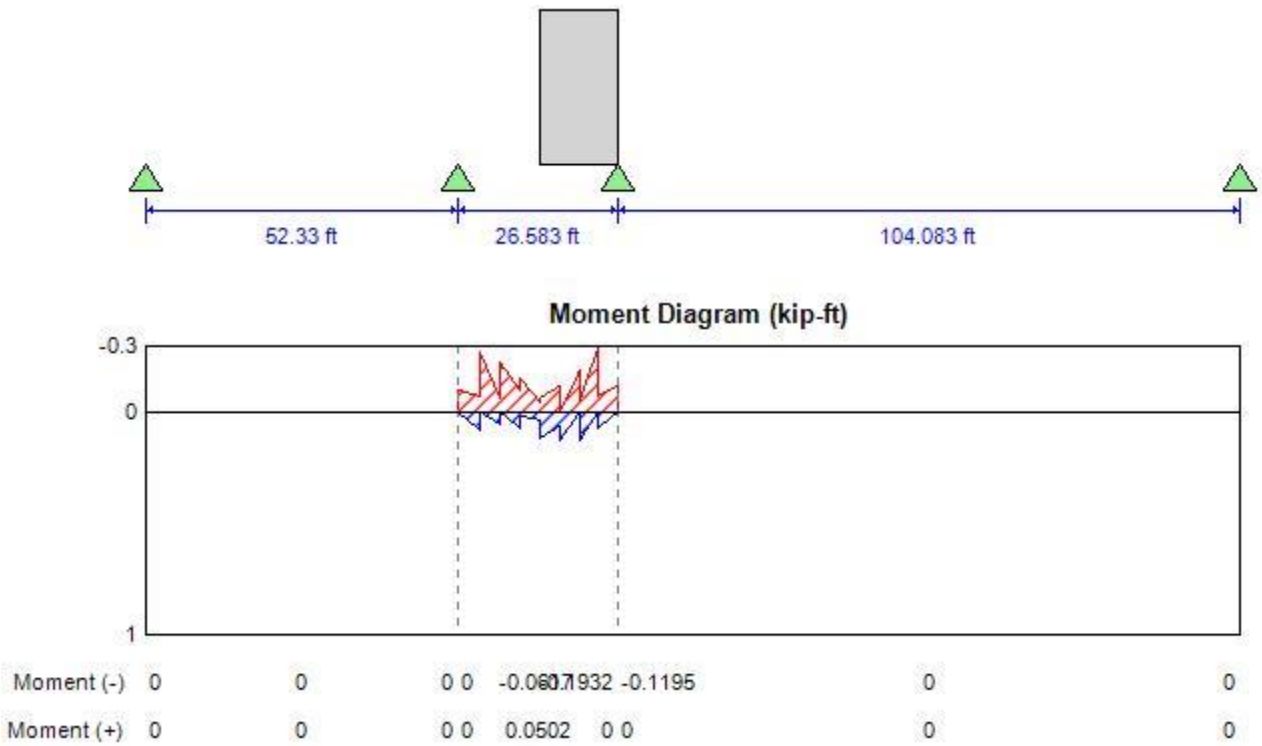
ACI 318-14 Concrete Strip Design

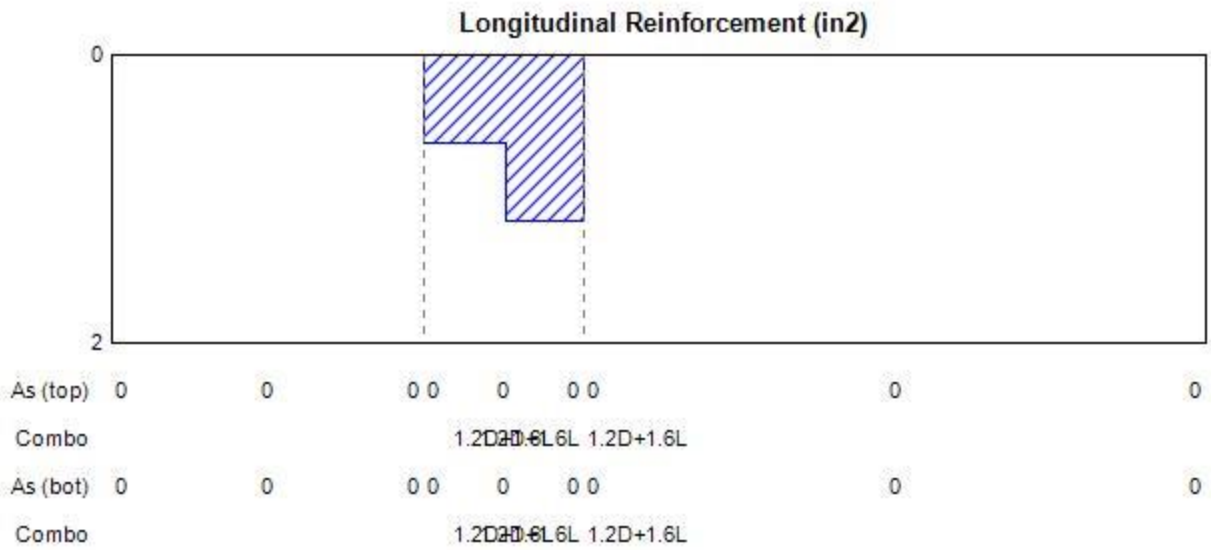
Geometric Properties

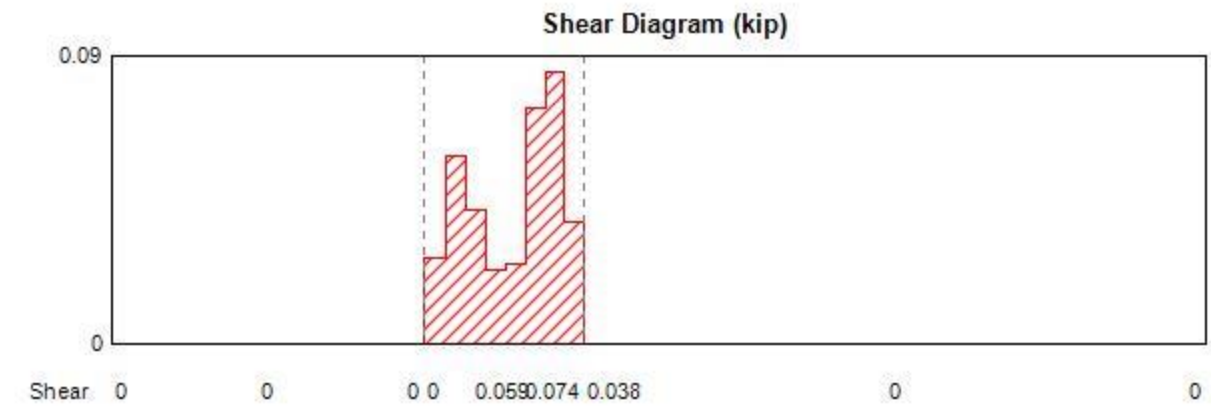
Combination = Overall Envelope
Strip Label = CSA10
Length = 182.996 ft
Distance to Top Rebar Center = 1.125 in
Distance to Bot Rebar Center = 1.125 in

Material Properties

Concrete Comp. Strength = 4 kip/in2
Concrete Modulus = 3604.997 kip/in2
Longitudinal Rebar Yield = 60 kip/in2




Longitudinal Reinforcement (in2)
0
2
As (top) 0 0 0 0 0 0 0 0
Combo 1.2D+1.6L 1.2D+1.6L
As (bot) 0 0 0 0 0 0 0 0
Combo 1.2D+1.6L 1.2D+1.6L


Shear Diagram (kip)
0.09
0
Shear 0 0 0 0 0.059 0.074 0.038 0 0